SEPTEMBER 27, 1954

NEWS ISSUE

Electrical World

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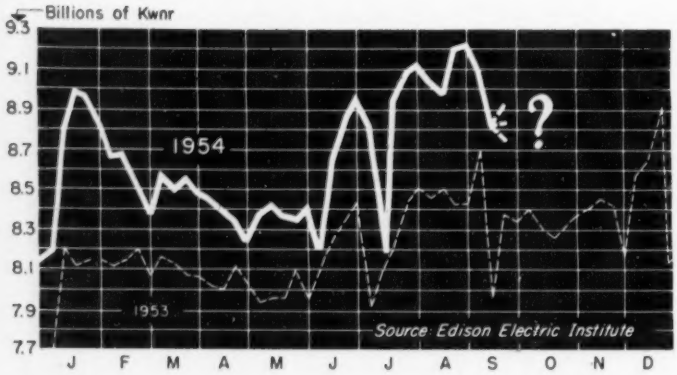


Output Week Ended Sept. 18—? ? ?, 000,000 Kwhr

for latest figures see page 3

Per Cent Change from Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Sept. 18	?	?	?	?	?	?	?		?	
Sept. 11	+10.6	−0.2	+7.0	+2.8	+8.4	+22.0	+30.0	−0.8	+3.6	+1.0
Sept. 4	+4.5	−13.7	−5.4	−3.7	+4.4	+16.1	+24.1	−2.0	+2.9	+4.7

Electric Power Statistics

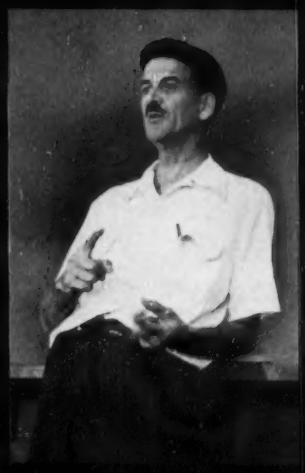
		Latest Month	Preceding Month	Year Ago
Peak Load‡ (Million Kw)	June	78.0	74.0**	73.0
Capacity (Million Kw)	July	96.98	95.31	86.11
Production (Billion Kwhr)	July	40.08	38.90	38.03
Hydro	July	8.76	9.59	8.75
Fuel	July	31.32	29.31	29.28
Fuel Consumption				
Coal (Million Tons)	July	9.40	9.29	9.59
Oil (Million Barrels)	July	4.45	4.29	6.34
Gas (Billion Cu Ft)	July	113.20	107.79	109.35
Sales (Billion Kwhr)	June	32.57	31.59	31.77
Residential	June	9.32	9.31	8.37
Commercial	June	6.04	5.62	5.46
Industrial	June	14.85	14.43	15.80
Other	June	2.36	2.23	2.14
Net Income Class A & B Companies ($ Million)	July	84.47	86.76	73.12
Estimated Dec. '54 Peak‡ (Million Kw)	July	88.1	88.1	91.9
Kwhr per Residential Customer (12 Month Average)	June	2,441	2,427	2,256
Revenue per Kwhr Residential Service (12 Month Average)	June	2.71¢	2.72¢	2.76¢
Canadian Production (Billion Kwhr)	June	5.67	5.93	5.26

a regular service providing up-to-date statistics

Business Statistics

FRB Industrial Production Index†	August	124*	116**	136
Gross National Product Annual Rate ($ Million)	2nd Qtr.	356.0	355.8	369.9
EW 4 Industry Production Index†	August	114.9	114.2	125.8
ENR Construction Cost Index††	July	135.0	130.5	126.6
BLS Consumer's Price Index	June	115.2	115.1	114.7
NEMA Insulation Materials Sales Index†	July	92	124	150
NEMA Electric Appliance Sales Index†	July	88	102	86
NEMA Household Refrig. Sales Index†	July	93	82	87

*Preliminary **Revised ‡Class 1 Systems †1947-49=100 ††1949=100

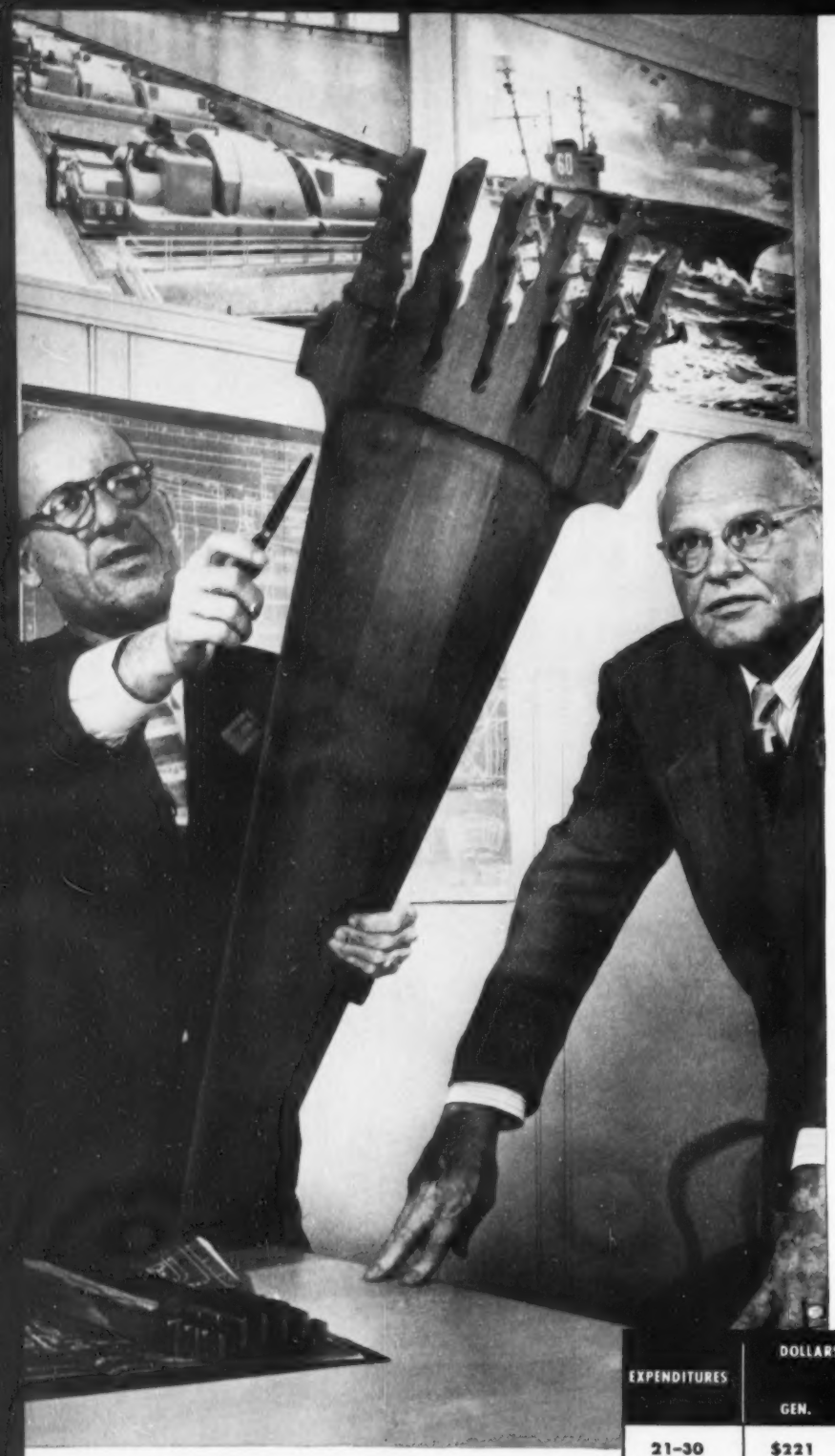


"Good management is still the heart and soul of a company. Without it, you've got a mob. With it, you've got a going concern—direction, purpose, and control."

This is the kind of advice Georgia co-op managers got from Dean Gates, University of Georgia, at a special course in co-op management.

See page 15

E B POWER GS W 12
UNIVERSITY MICROFILMS IN
313 N 1 ST
ANN ARBOR MICH



TREND TO HIGHER TURBINE EFFICIENCY is marked by new G-E 43-inch bucket for 1800-rpm unit as discussed by C. W. Elston, Manager—Turbine Engineering, and L. H. Auchmoody, Supervisor—Rotor and Diaphragm Engineering. In designing the new bucket, G-E engineers conquered a host of technical difficulties, and are now producing buckets for shipment in 1955. Design at the base of the bucket has solved the stress problem resulting from 330,000 pounds of centrifugal pull per bucket.

Longer turbine buckets—a new step to

Greater economy, larger turbines

A new 43-inch turbine bucket for 1800-rpm turbine-generators holds the promise of helping utilities boost dollar returns for their equipment and fuel investments. Developed by General Electric engineers, the new bucket sets the stage for greater turbine efficiency in the same ratings, and points to even larger turbines to come.

Huge coal savings

The first application of the new 43-incher is on a 191,000-kw turbine at Commonwealth Edison's State Line station. It will raise efficiency over largest previous buckets by 1.1%. The added bucket size on this unit operating at one-inch back pressure will produce savings of up to 12 million pounds of coal annually.

The longer last-stage bucket is one answer to stepping up turbine efficiency, more kwh output per ton of coal. For, although generation costs and efficiencies have been improving steadily through the years, distribution costs have dropped at a much faster rate.

General Electric, in co-ordinating its design engineering efforts with those of utility engineers, and in making new, better tools available, offers utilities the assurance that America's demands for electric power can be met competitively and at a profit. For full data on what's ahead in steam turbines, write for Bulletin GER-905. General Electric Company, Section 301-265, Schenectady 5, N. Y.

MORE POWER TO AMERICA

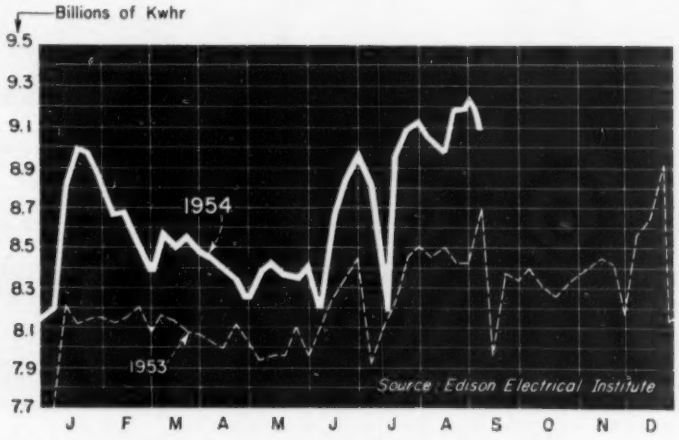
GENERAL ELECTRIC

EXPENDITURES	DOLLARS/KW OF SYSTEM INVESTMENT CONSTANT DOLLARS			COST INDEX DECADE AVERAGE
	GEN.	TRANS.	DIST.	
21–30	$221	$130	$214	100
31–40	91	33	194	104
41–50	105	37	105	152
51–53	114	36	84	240

IMPROVED EFFICIENCIES have cut system investments. Chart above shows dramatic generation cost reductions, though lagging behind distribution and transmission. Statistics from estimates in October issue of "Distribution" magazine.

Electrical World

September 27, 1954 Vol. 142, No. 13



Output Week Ended Sept. 18—9,074,000,000 Kwhr

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Seasonally Adjusted Index† 172.0 Week Ago 172.5** Year Ago 159.2

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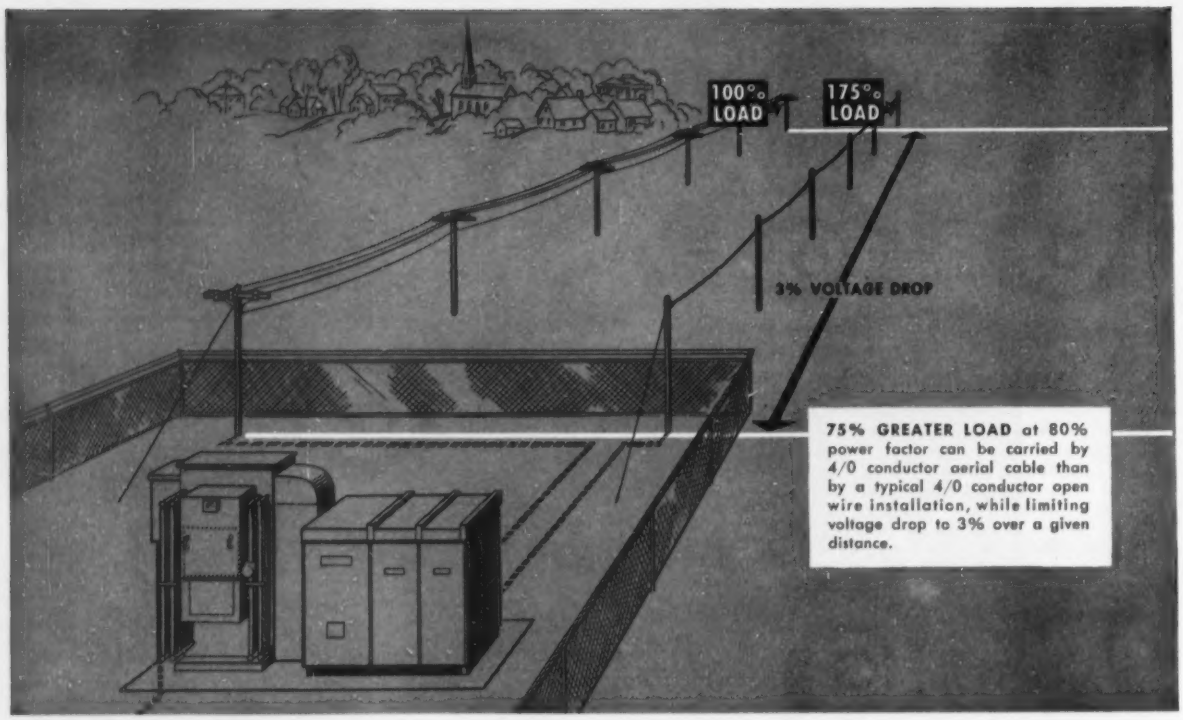
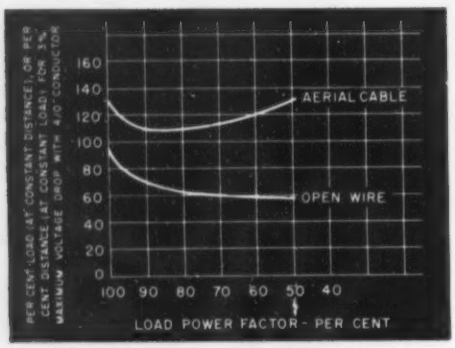
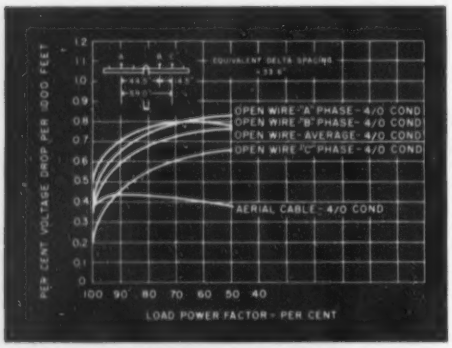

100% LOAD
175% LOAD
3% VOLTAGE DROP
75% GREATER LOAD at 80% power factor can be carried by 4/0 conductor aerial cable than by a typical 4/0 conductor open wire installation, while limiting voltage drop to 3% over a given distance.

WHERE VOLTAGE DROP SETS CIRCUIT LOAD LIMITS...



Comparison of load-carrying ability over a constant distance at 4.16 kv, 4/0 aerial cable vs. 4/0 open wire.


OPEN WIRE-A PHASE-4/0 COND
OPEN WIRE-B PHASE-4/0 COND
OPEN WIRE-AVERAGE-4/0 COND
OPEN WIRE-C PHASE-4/0 COND
AERIAL CABLE-4/0 COND
LOAD POWER FACTOR - PER CENT

Voltage regulation per 1000 feet
4.16 kv feeders, 1000 kva base, 3-phase

G-E preassembled aerial cable carries more load

General Electric preassembled aerial cable can help you meet the problem of load limitation due to voltage drop in distribution lines. Because of its lower reactance, this cable can carry far more load within a permissible voltage drop than can an open wire line of the same conductor size. (See graphs at left.)

As loads increase, this characteristic permits you to operate G-E Super Coronol* preassembled aerial cable at its full rated copper temperature. And, of course, this cable always gives you the benefits of its trim appearance and long life, reduction in tree trimming costs, safety, and service continuity in case of storms.

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Progress Is Our Most Important Product

GENERAL ELECTRIC

THE ELECTRICAL WEEK

The Issue's News Highlights . . . Eleven New England utilities organize Yankee Electric Co, an atomic energy generating company with NEES's William Webster as president.

Mississippi P&L relieves Secretary-Treasurer Stienteroth of his duties after he blasted its policies and charged it is dominated by Wall Street.

Public power groups ask SEC hearings on stock issue of Middle South, principal in Dixon-Yates deal.

On basis of Stietenroth charges (See p 7), and contentions by American Public Power Association and power boards of Memphis and Chattanooga, Tennessee Gov Frank Clement has asked President Eisenhower to suspend further negotiations between AEC and Dixon-Yates. Rep Chet Holifield (D-Cal), member of Joint Atomic Energy Committee, has called for a "thoroughgoing examination" of Dixon-Yates deal.

Fatal accidents to electric utility employees totaled 134 in 1953. This is five more than in 1952 according to report by S. H. Young, Hartford Electric Light, before EEI's Accident Prevention Committee in Philadelphia last week. Electric shock and burn fatalities totaled 93 for 1953 compared with 90 year before.

When atomic power plants can provide a cheap source of power for farms, REA will be ready to finance them, Ancher Nelsen, REA Administrator, told electric co-op members in Elmira, N. Y., last week.

Northwestern Public Power Association filed protest with FPC arguing rate adjustment clause in BPA's proposed new rate schedule is change of contract terms and therefore beyond FPC jurisdiction (EW, Sept. 13, p 62). NPPA recommended FPC approve rate filing but not rate adjustment clause.

Suit to condemn Washington Water Power holdings in Chelan County by county public utility district has been postponed until Jan. 10. Company is preparing inventories of its properties in Stevens County for a Superior Court hearing March 14 on their value. Stevens County PUD filed a condemnation suit against WWP facilities in that county.

Rural Electrification Day in Kentucky was proclaimed on Sept. 17 by Gov Wetherby when the 200,000th consumer was connected by a Kentucky rural electric co-op about seven miles from Prestonburg.

Answering a Democratic charge that Eisenhower Administration power policy has stalled the DMPA-approved Harvey Machine Co's plan, Sen Guy Cordon (R-Ore.) said the delay of Harvey's proposed aluminum reduction mill at The Dalles near the site of a huge federal hydro project on Columbia River has been laid to refusal of company to include aluminum fabrication operations in the $65 million facility.

Off the Washington Wire . . . A three-man task force to do spade work for Eisenhower's cabinet Committee on Energy Supplies and Resources Policy has been named. James F. Brownlee, general partner of J. H. Whitney & Co, and consultant to Defense Mobilization Director Arthur Flemming, has been appointed chairman. He will be aided on oil and gas matters by John Warren, National City Bank of New York vice president, and on coal studies by Charles J. Potter, president of Rochester & Pittsburgh Coal.

Van Court M. Hare, 20-year TVA engineer, is leaving to go with Uhl, Hall & Rich, Boston, who are engineers for St. Lawrence power project.

Stringing of 345-kv transmission line of BPA's McNary-Ross project (EW, Sept. 13, p 30) was scheduled to have been resumed Sept. 21 on experimental basis while new procedures are tested to further eliminate surface distortions.

Pine Bluffs, Wyo. is gaining favor as site for $10.5-million steam plant which would be built with REA loan by Tri-State Generation and Transmission Association. Bureau of Reclamation has told Tri-State's 25 co-ops in Wyoming, Colorado, and Nebraska that sufficient federal power will not be available to them after 1956 or 1957.

After a two-year study, SEC decided Northern States Power is an operating and not a holding company.

Grant County, Wash., PUD filed suit in Grant County Superior Court challenging legality of Washington State Power Commission on the ground that a 1953 state law creating it is unconstitutional.

Rep Howard H. Baker (R-Tenn.) has proposed an amendment to the TVA act authorizing that agency to borrow money and issue bonds or debentures to expand its power system.

Appalachian Electric Power will add a 225,000-kw steam unit at an estimated cost of $26.4 million to its Glen Lyn Plant on the New River in Virginia.

Washington Water Power is latest to sponsor wiring finance plan. It will make announcement Oct. 1.

Congratulations . . . Central P&L elected J. L. Bates president, succeeding Lon C. Hill who was named chairman . . . T. O. McQuiston, vice president of Metropolitan Edison, named president of the Pennsylvania Electric Association.

Regular News Services

News About People 46
Industrial Relations 52
Sales and Service 54
Manufacturers and Markets 59
Regulation and Rates 62
Financial 64

NEES' William Webster is president of . . .

New Atomic Firm Formed by New England Utilities

Eleven New England utilities have announced the organization of a new atomic energy generating company.

The new corporation, to be known as Yankee Atomic Electric Co, plans to enter into discussions with the Atomic Energy Commission to seek permission to construct an atomic power plant in New England capable of producing electricity for home, industrial, and commercial purposes.

Yankee Atomic Electric received approval of the Massachusetts Department of Public Utilities on Sept. 17 of its petition to issue common stock of $100 par value to finance its development program. Organization papers were then approved by the Massachusetts Commissioner of Corporations and Taxation. The company has authorized the issuance of $1 million in common stock of $100 par value. The Massachusetts Secretary of State has been notified of the formation of the company.

Participating Utilities . . . Utilities proposing to invest in the project include: New England Electric System, Boston Edison Co, Connecticut Light & Power Co, Hartford Electric Light Co, Connecticut Power Co, Western Massachusetts Electric Co, Public Service Co of New Hampshire, Eastern Utilities Associates, New England Gas & Electric Association, Central Vermont Public Service Corp, and Central Maine Power Co. Other companies may be added.

The firm's first president will be William Webster, executive vice president of New England Electric System.

Although Webster has not disclosed the location of the plant, the newly elected official said the corporation hopes an experimental nuclear power plant can be located in New England at an early date.

Experimental Work . . . Webster said, "We expect to explore the economic and practical aspects of this type of electric generation. It may take several years of experimental work before we can determine to what extent atomic energy will be used in the future by New England's electric companies. The potentialities are unlimited because the concentrated energy possessed by atomic fuels will simplify problems of plant location, fuel transportation, and storage. We believe the new fuel is going to play an important role in New England's electric future, and we feel that the lessons learned in the plant will produce the answer as to the extent we may depend upon electricity from the atom in formulating our short and long range expansion plans."

Webster noted that firms investing the necessary equity capital in the new organization plan to buy and distribute the project's entire output.

He added that if the proposed arrangements can be worked out satisfactorily, there is every reason to believe that within the foreseeable future the homes and factories of New England will be supplied in part with electric power from a plant deriving its heat from nuclear fission.

Firm's Directors . . . Directors of the new corporation are: Austin D. Barney, president, Connecticut Power, and chairman, Hartford Electric Light; Ralph D. Booth, Jackson & Moreland, engineers, Boston; Howard J. Cadwell, president, Western Massachusetts Electric; Floyd D. Campbell, president, New England Gas & Electric Association; Charles A. Coolidge, Boston lawyer; Albert A. Cree, president, Central Vermont Public Service; Thomas G. Dignan, president, Boston Edison; Sherman R. Knapp, president, Connecticut L&P; Irwin L. Moore, president, New England Electric System; Guido R. Perera, president, Eastern Utilities Associates; Avery R. Schiller, president, Public Service Co of New Hampshire; W. Webster; and William F. Wyman, president, Central Maine Power.

Other officers are: Treasurer, Harry Hanson, treasurer of NEES; and clerk, L. A. Wheeler, general counsel of NEES.

MP&L's 'Executive Suite' Saga

Mississippi utility relieves Stietenroth of duties after he blasts its policies and charges it is Wall Street controlled

Board of directors of the Mississippi Power & Light Co last week relieved Secretary-Treasurer J. D. Stietenroth of his duties after the veteran officer had publicly blasted company policies and charged that the utility is controlled by Wall Street.

At the special meeting called to consider the Stietenroth incident, the board voted to give the officer a further hearing if he desired to appear at a regular meeting. It also issued a counter statement to the Stietenroth accusations.

This confirmed earlier action by Mississippi P&L Pres R. Baxter Wilson who had relieved Stietenroth of all company duties immediately following the officer's public statement and interview given to Clarion-Ledger of Jackson, Miss. In a statement accompanying his action, Wilson pointed out that Mississippi P&L is closely regulated by the Federal Power Commission and the Securities and Exchange Commission. "There are no secrets or mysteries about the affairs of this utility," said Wilson. "The facts about its rates, its operations, and management are available to all properly interested persons."

Dominated by 'Wall Street' . . . In the 1,400-word written statement given to the local paper, Stietenroth charged that Mississippi P&L officers "have always been dominated by certain persons who are sometimes referred to as Wall Street." He named Middle South Utilities, Inc, and Ebasco Services, Inc, as among those he had termed "Wall Street." Middle South holds approximately 98% of the voting securities of Mississippi P&L and is also the holding company for three other operating utilities in the region. Ebasco Services, a consulting and engineering firm, is retained by the Mississippi utility to perform tax accounting and a number of other services.

In an interview with the Clarion-Ledger editor after submitting his blast, Stietenroth said the statement resulted from "an accumulation of many years of pressure and polite demands which have resulted in my functioning in my capacity as an officer of the company substantially as a puppet on a string." But in his statement, the company official had said, "I truly believe I would be better off dead and buried than to cease my struggle which has been going on for many years to prevent my complete enslavement."

He interlarded his statement with references to the Declaration of Independence and likened several of the southern states to a colonial empire dominated by Wall Street interests.

There were these specific charges by Stietenroth and comments from company sources:

- A Mississippi State official once refused to serve on the Mississippi P&L board "because he did not want to be a dummy director." Company sources noted that a number of outstanding citizens of Mississippi are on the board.
- The company charges excess rates. Company sources said Mississippi P&L rates, which are not state regulated, provide the same rate of return on investment as those of neighboring utilities which are regulated by state commissions. FPC figures show that residential rates of Mississippi P&L are right in line with those of Mississippi Power Co, which Stietenroth had cited as having lower rates.
- The company keeps two sets of books—one in Jackson and one in New York. False, say officials.
- Recent decision to call in an issue of long outstanding 6% preferred stock and issue other shares at a lesser dividend rate "is nothing but the big fish eating the little fish." Company sources said they had offered holders of the $6 shares extremely favorable terms of exchange.

Officials were reluctant to ascribe motives to Stietenroth, but noted there had been recent organization changes in the company (EW, Sept. 6, p. 168) and that he had dissented against calling in the stock.

Con Edison Installs Fuel-Handling Dock

This fuel-handling dock, first of its kind in the U. S., has been installed at Astoria Plant of Consolidated Edison Co of New York. Similar to radar platforms recently announced by the U. S. Air Force, it will support a coal unloading tower. It consists of two sections each measuring 60 by 234 ft. Steel cylinders 6 ft in diameter are dropped through holes in the dock, and a special jacking system hoists up the structure on cylinders, which become the piling of the final structure. When dock is at proper elevation, parts of steel cylinders still projecting are burned off level with dock.

New Dixon-Yates Stall Tried

Public power groups call for SEC hearings in attempt to tie Middle South stock offering to combine's power contract

A last-minute maneuver by public power groups to enmesh Dixon-Yates power deal in securities red tape is being effectively combatted by Middle South Utilities, Inc, one of the Dixon-Yates principals.

Middle South recently asked the Securities and Exchange Commission permission to sell 475,000 shares of stock. The application said the principal purpose was to repay some $12 million in bank loans.

Requested SEC Hearings . . . Last week, the American Public Power Association and the Memphis and Chattanooga Power Boards asked SEC to hold hearings on Middle South's proposal. APPA Pres Alex Radin said Middle South's application is a step in the company's planned investment in Mississippi Valley Generating Co, the firm established by the Dixon-Yates combine. He said a hearing should be held because the Dixon-Yates proposal appears to violate the Holding Company Act to 1935.

Whether SEC decides to conduct a hearing hinges on its determination of whether Middle South's proposed stock sale involves investment in the Dixon-Yates steam plant, which is to cost an estimated $107 million and be built near West Memphis, Ark. If SEC is satisfied that the claims of the public power groups are valid, and some of the excess from the Middle South stock sale is earmarked for Dixon-Yates investment, a hearing probably would be held, and the Mississippi Valley Generating contract subsequently delayed.

If SEC rules that such is not the case, APPA and the two city power boards will not have proved to SEC's satisfaction that they have an interest in the stock sale, and therefore their request for intervention will be denied because they are not "instant parties" as required by law.

Proceeds Earmarked for Debts . . . In Middle South's original application to SEC, the firm stated it planned to use the proceeds from the stock sale to repay $12 million in outstanding debts. Any excess, it said, would be added to its treasury "to be available for investment in the common stock of the system operating companies or for other corporate purposes." This vague wording gave the public power groups cause to become suspicious and therefore, request for intervention on the stock sale.

Last week, however, Middle South moved to eliminate the opportunity for a hearing on the stock sale. It sent a letter to SEC stating specifically that none of the proceeds from its sale of the 475,000 shares of common stock would be used for investment in the Dixon-Yates facility unless authorized by SEC in subsequent proceedings. This, in effect, is a statement from Middle South that it does not plan to violate the securities laws. However, it also paves the way for SEC approval of its application to sell stock, leaving for later proceedings the question of whether any of the proceeds will go into the Dixon-Yates steam plant.

A pertinent excerpt from the Middle South Utilities letter to SEC follows:

"None of the proceeds of the offering will be used by the corporation to make investments in the Mississippi Valley Generating Co except as may be authorized in other proceedings before the SEC, and such corporation (Middle South) consents that any arguments which could be advanced in the above proceedings against such investments or the financing thereof can be advanced in such other proceedings." It still leaves open way to debate on Middle South investment in Dixon-Yates if the firm channels any of the proceeds of this stock sale into Mississippi Valley Generating.

Surveys Power Site

Pennsylvania Power & Light Co is investigating power generation possibilities in an area along the west bank of the Susquehanna River, adjacent to Lock Haven, in line with its plan for additional expenditures of $147 million for facilities through 1958.

DR WILLARD F. LIBBY

Libby Joins AEC

Chicago University professor succeeds Dr Henry D. Smythe as a member of the commission

Dr Willard Frank Libby has been appointed a member of the Atomic Energy Commission by President Eisenhower to replace Dr Henry DeWolf Smythe, who served on the commission for the last seven years. Libby's appointment becomes effective Sept. 30.

Dr Libby reported to Electrical World that the principal function he hoped to fill with AEC would be as a scientific and technical member.

Dixon-Yates Controversy . . . When asked his position on the controversial Dixon-Yates power contract, Dr Libby said he was not well enough informed at this point to take a position. He did indicate that he was glad to see industry interested in the development of atomic power.

Libby became an instructor at the University of California in 1933, later becoming a professor. In 1941, he received a leave of absence and joined the staff of the SAM Laboratories at Columbia University. This group worked on certain phases of the atomic bomb problem.

Libby remained at Columbia until the end of the war in 1945 when he was offered a position as professor in the Department of Chemistry at the newly formed Institute for Nuclear Studies at the University of Chicago, a position which he has held until the present time.

U.S. Must Play . . .

. . . leading role in developing peacetime atomic energy, AEC aide tells steelworkers

Atomic Energy Commissioner Thomas E. Murray told the United Steelworkers of America last week the government must continue to play the leading role in the development of peacetime atomic energy, particularly in the high-cost power program.

He said it is unrealistic to expect private industry to undertake, on a purely risk basis, anything like the effort that the world atomic power problem demands. To continue building power reactors, he said, we must have a strong program of government support.

To illustrate the economic uncertainties encountered in nuclear power ventures Murray reported that informed bids for supplying major units of the new Shippingport, Pa., plant of the Duquesne Light Co varied as much as fivefold in some cases. "How then can we intelligently discuss the cost of atomic power at the present time?" he asked.

Dual-Purpose Unit Best Business Bet . . . Murray admitted that so-called dual-purpose reactor, designed primarily to produce military-grade plutonium for sale to the government and creating power as a by-product, looks on the surface like the best bet from a business standpoint. However, he warned that the government already has in operation and under construction sufficient facilities to supply present military requirements for weapons-grade plutonium.

The commissioner said this country cannot afford to drag its feet in its program to further development of nuclear energy in the cause of peace. Partly as a gesture, but also as an investment, he called for the placing of an American-made, American-financed power reactor in Japan, which suffered the first blows from atomic weapons. He said foreign nations will need the power from atomic reactors long before the U. S. will, since our supplies of traditional fuels are in no danger of running out quickly.

AEC Chairman Lewis L. Strauss in a separate talk before the National Association of Science Writers predicted that within a few generations, Americans will enjoy in their homes electrical energy "too cheap to meter."

Strauss also reported that AEC expects its operating expenditures to level off at about $2 billion annually after its plants are all completed. This compares with estimates of operating expenditures for fiscal 1955 of about $1 billion. AEC's estimate of its expenditures this year is for $2.2 billion, but somewhat more than half of this is for construction of facilities.

Improved Power Factor Seen for Air Conditioners

Room air conditioners of the future will have better power factor characteristics, according to the new recommendations of the Air-conditioning and Refrigeration Institute—Edison Electric Institute—National Electrical Manufacturers Association Joint Committee. Requirements are that minimum values under Underwriters' Laboratories maximum normal load test conditions shall be not less than 85% for units with motors of ¾ hp and larger.

Technical difficulties in smaller units reflect in limits of 80% pf for ½ hp and 75% for ⅓-hp units. Sales of these smaller units totaled less than 22% of room air-conditioner sales in 1953.

Most installations are expected to operate at better than the specified minimum power factors under conditions encountered on heavily-loaded utility distribution systems.

Effective date has been proposed by this interim report as Jan. 1, 1956. Earlier designs already have been established and manufacture begun, but the joint committee anticipates substantial improvement in units marketed during 1955. Additional improvement in operating power factor will be sought by this joint committee for all air conditioners marketed after Jan. 1, 1957.

New York State E&G Makes It 400,000

Last month New York State Electric & Gas Co hooked up its 400,000th electric customer. To mark the occasion company officials were on hand to install a special gold-plated meter in the home of their new consumers, Mr. and Mrs. Marion A. Crawford of Endwell. Pictured (left to right) are Joseph N. Mayer, state superintendent of meters; James O. Barden, Endicott manager; Howard E. Orton, Binghamton Division manager; Arnold W. Milliken, vice president and general manager; and the Crawfords and their two sons, Barry, 4, and Brian, 2. Company presented the lucky milestone customers with an electric freezer and electric dryer.

IN THE INDUSTRY

Secret Specs Open Bidding

Atomic Energy Commission's first call for lump-sum bids on an atomic power plant for the army highlights the onerous task of working under the government's atomic secrecy program. Secret specifications for the approximately $4-million "package" power plant (EW, Aug. 30, p 15) went out last month to 33 carefully selected firms which had indicated an interest in bidding on the prime contract for manufacture and erection of the plant. Each of these firms had qualified personnel cleared to study and handle the restricted information in the specifications.

Trouble came when these firms started casting around for firm quotations on components to be furnished under subcontracts. A large number of the component manufacturers didn't have personnel cleared for access to the information in the specs. What's more, there is no quick and easy way of obtaining this clearance.

Right now it takes around three months for a person to obtain the "Q" clearance required to gain access to restricted atomic information. Intensive Federal Bureau of Investigation or Civil Service investigation is required to determine whether a person is eligible for this security clearance.

Even before an investigation gets underway, Atomic Energy Commission or some other government agency must certify that the applicant for clearance has a "need to know" restricted information. There is doubt that AEC would certify to that need merely on the basis that the potential subcontractor had been asked for a price quotation on a component of the "package" plant.

What Is Happening . . . Where the prime bidders have run into difficulties in sharing sufficient information to get firm price quotations, they have had to move on to other cleared components manufacturers who can study the specs. This means that the uncleared firms are being barred from bidding.

Within the past two weeks, several of these uncleared firms have sent up a howl for help. Representatives have called on industry associations and on government officials to find a way to participate in the subcontract bidding.

The secrecy bar is also partially defeating one of the main purposes of the government's lump-sum bidding procedure on the package plant. That purpose was to foster the price-trimming practices of free competitive bidding on all parts of the plant with the aim of getting the lowest possible price on the finished product.

In the past atomic projects of a similar nature had been handled almost entirely under negotiated bids. Much less emphasis had been put on rock-bottom costs. This meant that the prime contractors could rely entirely on cleared subcontractors instead of casting about for the most favorable price quotations.

Legislative Remedy . . . Fortunately, AEC and Congress have anticipated this secrecy problem and have sought to provide at least a partial solution. The new atomic energy law signed last month provides the machinery for relaxing the tough restrictions that now bind much of the technical information necessary to the development of atomic industrial power.

In general terms the law provides for grading the technical information held by AEC. The sensitive atomic weapon information, for instance, may be kept in its tight super secret classification. Less sensitive information can be downgraded to a lower classification.

Similarly, the security requirements for cleared personnel would be graded. A person who needed access to the sensitive weapon information would still require a "Q" clearance. The less sensitive information, which AEC staffers have tagged the "gray area," would be made available to persons who had successfully passed a less rigorous security check.

Right now all the restricted information can be opened only to those with the "Q" clearance, and this situation will continue until AEC draws up its rules and requirements for handling the less sensitive information.

Men with an intimate knowledge of AEC classification procedures believe that much of the information necessary for the industrial development of atomic power can safely be downgraded to the "gray area" classification. If AEC really wants to, say these men, these changes can be completed by the end of the year.

As the law is vague on timing and specific guidance for the AEC rule-makers, there is no guarantee that the new rules will offer an easy solution to the problem.

At best, it is a long-term solution and not applicable to the present plight of component manufactures who want to submit quotations on the package power plant.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Separate ground leads for arresters mounted on structures are used by most utilities rather than depend on the metal structural members to furnish the path to the substation ground system or bus.

High superheat trend and reheat units greatly accentuate the need for proper cleaning of superheat and reheat surfaces to maintain highest temperatures, particularly at reduced loads. Every 30 F increase means 1% fuel saving.

Transmission lines 70 to 110 ft high in areas where there are 25 to 45 thunderstorm days per year are struck by lightning on the average once per year per mile.

Ratio of the fundamental frequencies with grounded and isolated neutral may vary in uniform windings between two (for transmission lines) and infinity (for ideal transformer). In practice it is between 2 and 3 for air coils and between 4 and 10 for core-type transformers.

Lightning arresters should (1) have a reliable low-resistance ground, (2) be connected as close as possible to the terminals of the protected apparatus, and (3) have as short and direct a path to earth as is practicable.

Electric energy generated on a diesel-electric locomotive requires about 12,400 Btu per kwhr. At 10¢ per gal of oil this means about 9 mills per kwhr.

it's time for a new meter...

when Mrs. Riley...

gets her electric range

Since the day she took up the role of homemaker, Edith Riley has had a gas stove, of one kind or another, in her kitchen. But times have changed, and, well . . . the Rileys are getting an electric range this time.

The Rileys, and the thousands of American families like them who are turning to electricity to do more and more things, are going to need high capacity meters.

There is a new extended range meter on the market that will easily handle the heavier loads created by the rapidly increasing use of electricity. It's the Sangamo J2, a 15 ampere meter with straight-line accuracy up to 100 amperes. As a matter of fact, the J2 has the capacity to carry 100 amperes *continuously* without overheating, yet it has sufficient torque to accurately measure even the lightest load.

When you invest money in meters you know are going to have to handle greater and greater loads, protect your investment by choosing a meter with plenty of reserve ability to measure the growing use of electricity.

Choose the new Sangamo J2—the first . . . and finest . . . 15 ampere meter with 100 ampere capacity.

A METER WITH STRAIGHT LINE ACCURACY

UP TO 100 AMPERES

SANGAMO
ELECTRIC COMPANY
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JM54-7

RM POWER TRANSFORMERS

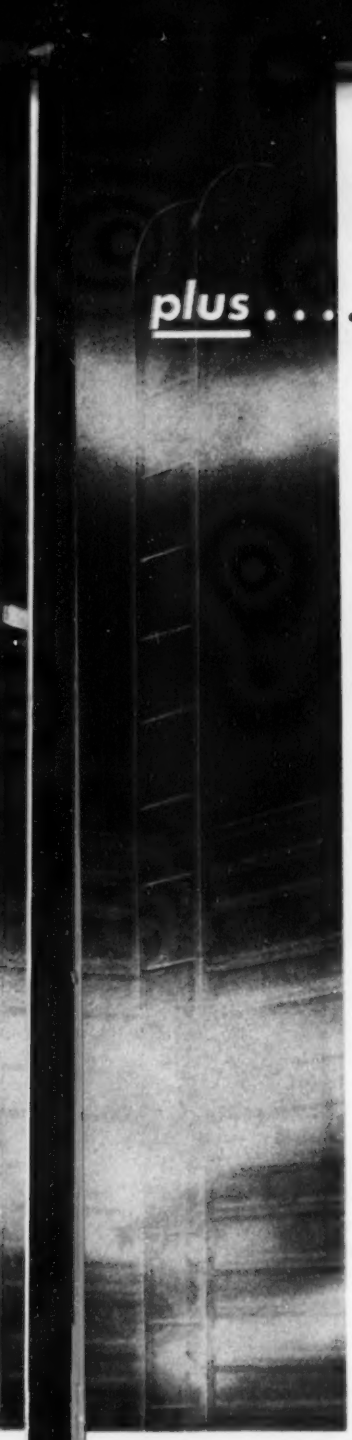
the benefits of ASA standards

RM* brings you all these benefits

Repetitive Manufacture gives you the economy of a standardized product, yet with optional ratings and accessories sufficient to meet most special needs. Ordering is simpler, shipment is many weeks faster, and prices are up to 8% lower than those of non-standard units.

**RM is the G-E designation for ASA-standardized power transformers 69 kv and below, 501 through 5000 kva single-phase, and through 10,000 kva three phase.*

LOWER PRICE



plus.....High dielectric strength

from vapor-phase drying which removes entrapped moisture

When you need a transformer in the medium range, order a General Electric Repetitive-Manufacture transformer, and you'll get all the benefits of ASA standards plus many extra advantages that give you better performance, easier handling and less maintenance.

HIGH DIELECTRIC STRENGTH, for example, and better short-circuit protection are assured by an RM production technique called ***vapor-phase drying***. Entrapped moisture, if left in the coil assemblies, would lower the dielectric strength of the insulation. Later this same moisture could seep out—causing shrinkage, loose windings, and a weakening in short-circuit stress resistance.

Vapor-phase drying removes the moisture which is present in the insulation during manufacture. At the new Medium Transformer Plant, all units rated above 15 kv and 2000 kva are given this unique treatment which uses vapor from boiling oil. As shown at left, the hot oil vapor permeates the windings and condenses on the coils—releasing the latent heat of vaporization. It is this heat which warms the windings and insulation to the point where, in combination with a high vacuum, moisture is driven out of the structure and carried away. These "pre-shrunk" windings are then securely tightened into a compact coil stack which will remain tight in service giving maximum resistance to short-circuit stresses.

MANY OTHER BENEFITS result from the advanced methods and processes used in General Electric's new plant at Rome, Georgia. These include a stronger liquid-tight tank from submerged arc welding, superior rust prevention because new Super Melaglyp lasts up to 150% longer, quicker delivery from faster, conveyorized production. Built solely to produce power transformers in the medium transformer range, this plant serves utilities and industries by turning out better products in shorter time. You can get full information about RM power transformers by contacting your nearest G-E Apparatus Sales Office, or by writing for Bulletin GEA-6108 to General Electric Company, Section 422-11, Schenectady 5, New York.

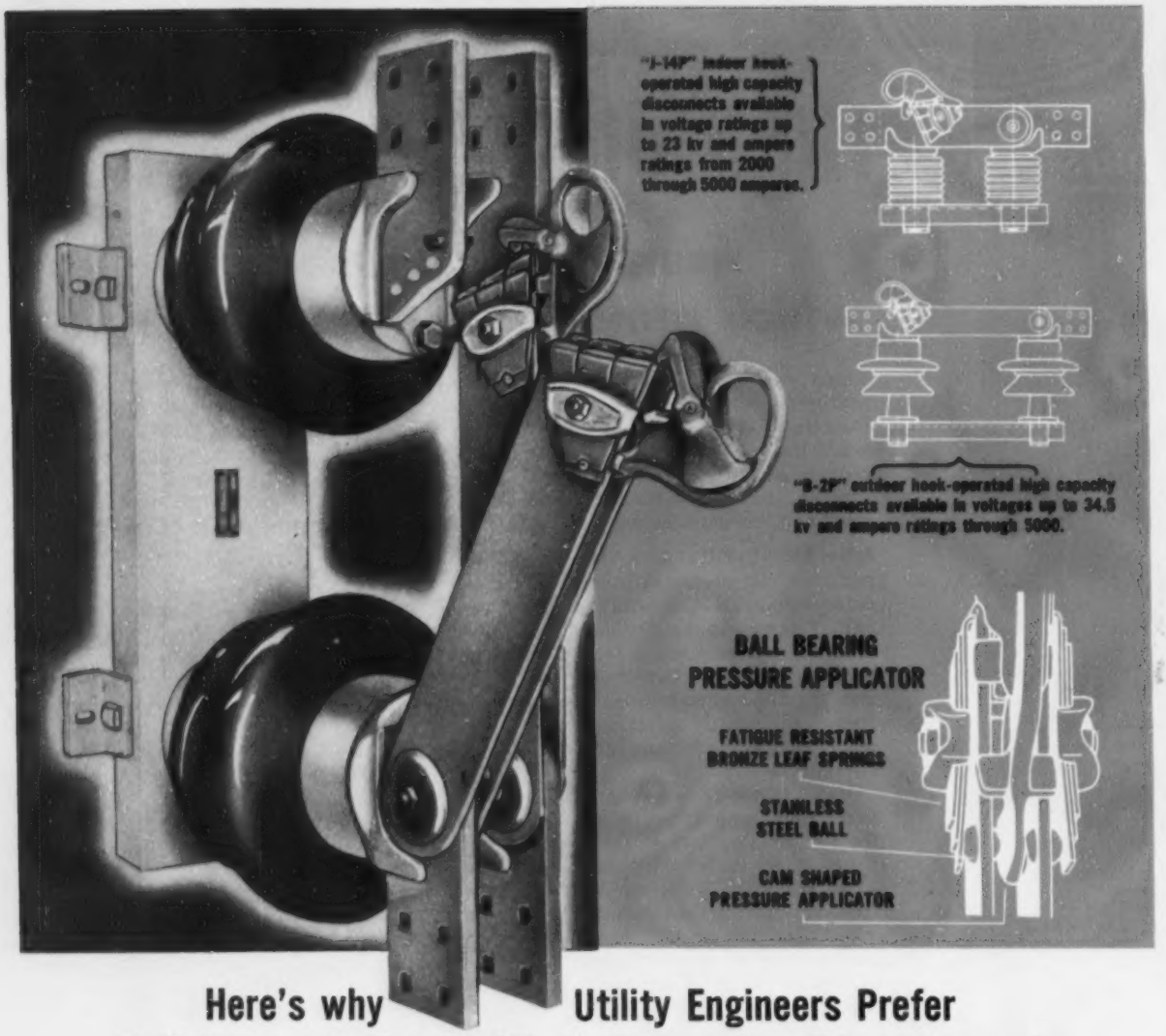
Progress Is Our Most Important Product

GENERAL ELECTRIC

SIMPLIFIED PURCHASING

SHORTER SHIPMENT

G.E.'s NEW ROME, GA., TRANSFORMER PLANT—built specifically to meet the growing trend to standardized power transformers.


"J-14P" indoor hook-operated high capacity disconnects available in voltage ratings up to 23 kv and ampere ratings from 2000 through 5000 amperes.
"B-2P" outdoor hook-operated high capacity disconnects available in voltages up to 34.5 kv and ampere ratings through 5000.
BALL BEARING PRESSURE APPLICATOR
FATIGUE RESISTANT BRONZE LEAF SPRINGS
STAINLESS STEEL BALL
CAM SHAPED PRESSURE APPLICATOR

Here's why Utility Engineers Prefer DELTA-STAR High Capacity Disconnects

Exclusive ball pressure applicator and blade lock mechanism which applies contact pressure after blade is in fully closed position, and releases contact pressure before blade is opened. Hook-ring operated, this device makes operation of a 5,000-ampere disconnect as easy as one rated 400 amperes.

Straight line current path so essential in high capacity disconnects, minimizes number of current interchange surfaces and avoids danger of "blow-out" force on switch blade under short circuit conditions.

All current carrying parts are of **hard drawn copper** assuring lowest possible temperature rise.

Heavy silver inlayed contacts backed by silicon bronze pressure springs provide efficient low resistance, high pressure contacts.

DELTA-STAR Heavy Duty Disconnects meet your most exacting specifications for long, efficient, trouble-free service. Specify DELTA-STAR B-2P Disconnects for your next outdoor installation or J-14P for indoor service.

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University of Georgia 'Capsule Course' is helping cooperative managers in . . .

LEARNING CO-OP MANAGEMENT INSIDE AND OUT

Taking time out from battling heat, drought, and the Clark Hill power issue, more than half of Georgia's Rural Electric Membership Corporation managers met at the University of Georgia last month for a three-day management session. It was the third session this year attended by the EMC bosses — one of a series of four that is designed to sharpen up management talent. The fourth will be held this fall.

Idea for the Executive Development Course for Cooperative Managers, as it is officially called, came from University of Georgia's College of Business Administration Dean James E. Gates and Fred Nance, Rural Electrification Administration field representative of Decatur, Ga. Nance heard of Gates' short courses for other businessmen such as petroleum jobbers, accountants, lawyers, so why not

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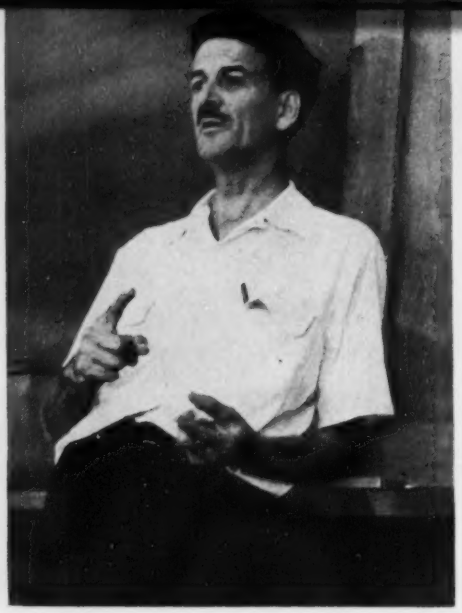


CO-OP MANAGERS LISTENED TO INSTRUCTORS LIKE DEAN GATES . . .

one for EMC managers? He took the idea to Jim Gates who was no novice to the electrical field. Gates, an educator who believes more in practical experience than in theory, served several years with the Federal Power Commission in Washington.

Gates agreed to set up a four-session program for the EMC managers, consisting of three days of seminar and field trip work at each session, if it could be shown that cooperative management was interested. Response was overwhelming. More than half of all the co-op managers and assistant managers in Georgia agreed to attend the session in Athens at their own expense. Georgia State Board of Education pitched in too. The board agreed to furnish the training specialists and instructors needed for the course.

Since the first meeting, attendance has been close to 100% of the original membership—a fact that attests to the value of the program. As one of the EMC managers put it: "It's a sure bet that we wouldn't keep coming back unless we figured we were getting something out of the program."

Interchange of Ideas, Experience . . . What the EMC managers really get from the Executive Development Course is mainly what they bring into it—an interchange of ideas and experiences. Instructors like Dean Gates, William Brady, and J. L. Langston of the State Department of Education were on hand to guide the thinking and direction of the seminar sessions more than to deliver lectures.

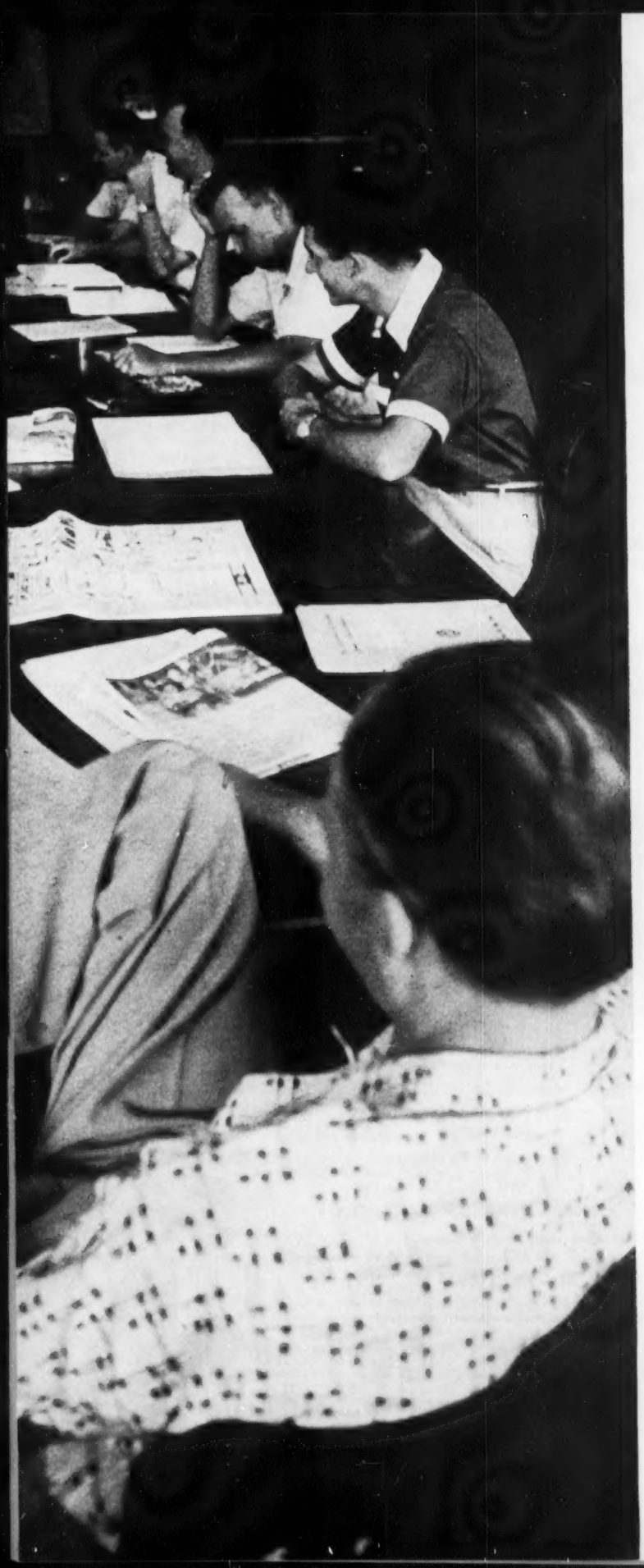
But at the same time the group got some other top lecturers too such as Marshall Pollock, solicitor for Georgia and president of Georgia Electric Membership Corporations, who headed up a three-hour round table discussion of the legal functions and regulations of REA. And William Crisp, general counsel for North Carolina, conducted a short course on legal documents—contracts, mortgages, deeds, etc.

Field Trips . . . There were also field trips to nearby industrial plants to discuss personnel policies, particularly with regard to the selection of employees.

But just as formal sessions were characterized by the everyday problems that confront an EMC manager, the coffee and coke breaks were taken up largely with a rehash of a problem that's bothering a lot of Georgia and South Carolina co-ops right now—what to do about the Clark Hill power question. Thus far, the co-ops have not had an answer from Interior Secretary Douglas McKay on the tri-contract proposal submitted last May by the power companies. Says J. R. Chambliss, manager of Little Ocmulgee Electric Membership Corporation and member of the power committee of Georgia EMC to get Clark Hill power: "If Secretary McKay approves the tri-contract proposal of the power companies, we are ready to enjoin his action as a violation of the Flood Control Act of 1944."

Extended Program Sought . . . Co-op managers will return to Athens next month for a final session of what Dean Gates calls the "capsule course." That session will conclude the management course laid out last January by the University. But already there is considerable agitation among the EMC managers to extend the program into next year and cover some of the more technical subjects a little more deeply than they've had time to up to now. Result may be an indefinite extension of the special program.

Particular subjects that the EMC managers want spelled out in more detail: Lender-borrower relationships, special legal services, duties of the co-op's attorney, and how to run a board meeting.



Then They Discussed Their Problems and Experiences Around the Conference Table and During Coke Breaks . . .

and Went Back Home Knowing More About Management Techniques

For Troublefree Substation Performance

CHANCE Type H Rotating Stack Switches

Only 3 Moving Parts

Easy to Install

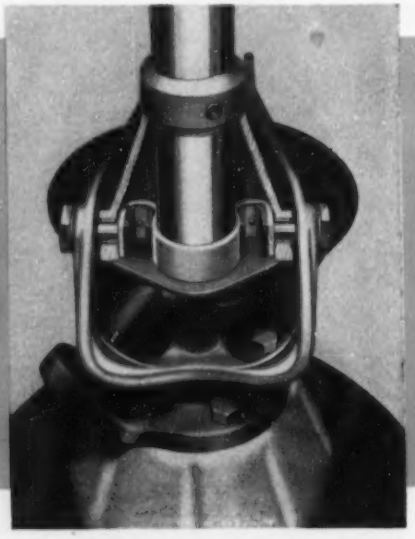
Continuous Hinge Contact

Switching operations on today's heavily loaded power systems demand rugged switches that are simple in design and have the ability to give years of unfailing performance—without maintenance—under any climatic conditions.

Chance Type H Rotating Stack Switches meet these demands because of features like *continuous hinge contact*. The contacts at the hinge end of *all* Type H switches are held under constant pressure in both the open and closed positions. U-shaped pressure springs carry no current and support no weight. The blade closes with a rotating motion that makes a clean, high-pressure contact . . . ice accumulations are broken with ease.

Outdoor
Group-Operated
Airbreak
7.5 through 230 KV
400—600—1200
Amperes

Cutaway view at right shows the hinge exposed. Contacts are completely enclosed at all times ...protected from oxidation and corrosion. Pressure springs are made from beryllium copper.

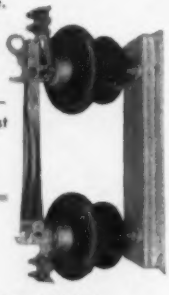


There are only three moving parts on the Type H—this means years of dependable, trouble-free performance. A universal control crank makes it easy to adjust the controls to within 5° of any position and permits the control mechanism to be easily adapted to any structure.

USE CHANCE HOOK STICK SWITCHES, TOO!

Chance Hook Stick Switches are rated from 7.5 through 115 KV, 400—600—1200 Amperes. All meet NEMA and AIEE requirements and all pass the most severe tests for high currents, icing, insulation characteristics and long life.

Write today for complete information on these Chance Switches.



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Europe's Atom Role

Hafstad tells Brussels parley Europeans face fewer obstacles in nuclear field than U. S.

Despite the tremendous lead achieved by U. S. scientists and engineers in the drive to develop economic nuclear power, European workers in the field will have fewer obstacles to overcome in reaching this goal, according to Lawrence R. Hafstad, director of Atomic Energy Commission's Reactor Development Division.

Dr Hafstad addressed the Congress of Industrial Chemistry, meeting recently at Brussels, Belgium. He told the European experts that foreigners, who will share in the technology developed in this nation's ten-year, $12-billion atomic energy program, have these two advantages over Americans in their efforts to develop competitive atomic power:

- A "lower" goal, nearer to the starting point in the development race because European power costs from traditional sources are so high, the costs of atomic power need not be brought so low to be competitive.
- Lower costs will enable European researchers to get more scientific "mileage" out of their research dollars.

Dr Hafstad seemed to emphasize these points in an effort to overcome pessimism on the part of European scientists heretofore excluded from even basic discoveries in atomic energy in this country. He translated into dollars his estimates:

Cost Assessed . . . "Now, to assess the probable overall relative cost of research and development in this field in the United States as compared with Europe, we might multiply the two primary advantage factors I have mentioned—the nearer goal on the one hand and cost and ability on the other —and get a ratio of one to four as the real cost advantage Europe has over us across the ocean. You will recall that my figure for developing competitive nuclear power in the United States was several hundred million dollars. The corresponding figure for Europe, then, would be only one-fourth of that amount, say $50 to $75 million. With these facts in mind, I hope that you will not be too impressed by the astronomical dollar figures you hear for the atomic energy program in the U. S. A."

Warns Against Duplication . . . Dr Hafstad warned the Europeans they would be making a mistake to duplicate reactors developed in this country, since the mission of these reactors will be different from that in store for those used in Europe. He stressed the difference between the American mass-production principle which would utilize energy from United States commercial reactors, and the less imposing production techniques of Europe.

He also cautioned against the drawing of conclusions as to the promise of any of the individual reactors involved in AEC's so-called "five-year plan." He pointed out that, if AEC had any definite knowledge as to which design would prove economically best, it would concentrate on that design, and discard, for the moment at least, efforts to prove the others.

The American official listed as perhaps the two biggest technical problems to be solved in development of nuclear power:

- Discovery of a fuel element which will stand high temperature, have long life, and be cheap and easy to fabricate and reprocess.
- The safety problem, with its associated problems of high insurance costs and public liability.

Dr Hafstad said U. S. negotiations with Belgium on building an atomic power plant in that country will be followed quickly by similar plans and arrangements with other foreign countries.

MEETINGS CALENDAR

ATOMIC INDUSTRIAL FORUM, INC
Meeting on "What the New (Atomic) Law Means", Hotel Plaza, New York, Sept. 27-28; Meeting on "Atomic Opportunities in New England", in conjunction with New England Council, Statler Hotel, Boston, Oct. 20.

EDISON ELECTRIC INSTITUTE
Residential Promotional Committee Meeting, EEI Headquarters, New York, Sept. 27-28; Industrial Relations Committee, Round Table Conference, Palmer House, Chicago, Sept. 27-29; Meter and Service Committee, Leland Hotel, Springfield, Ill., Sept. 27-29; EEI-AGA Tax Committee, Brown Palace Hotel, Denver, Colo., Sept. 29-Oct. 1; Prime Movers Committee, De Witt Clinton Hotel, Albany, N. Y., Oct. 4-5; Claims Conference, Hotel Cleveland, Cleveland, Oct. 5-6; Area Development Committee Organization Meeting, Hotel Statler, Cleveland, Oct. 6; Area Development Workshop, Hotel Statler, Cleveland, Oct. 7-8; Transmission and Distribution Committee, Sir Francis Drake Hotel, San Francisco, Oct. 7-8; Electrical Equipment Committee, Hotel Statler, Hartford, Conn., Oct. 11-12; Commercial Division General Committee Meeting, EEI Headquarters, New York, Oct. 15; Industrial Relations Committee in conjunction with North Central Electrical Association, Minneapolis, Minn., Nov. 18-19; Prime Movers Committee, Astor Hotel, New York, Nov. 29-30; Industrial Relations Committee, EEI Headquarters, New York, Dec. 16; Industrial Relations Committee, EEI Headquarters, New York, Jan. 20, 1955; 1st Street Tree and Utility Conference, co-sponsored with EEI Transmission and Distribution Committee and Street Lighting Committee of Illuminating Engineering Society, Wade Park Manor, Cleveland, March 3-5, 1955; Sales Conference, Edgewater Beach Hotel, Chicago, March 28-31, 1955; Annual Convention, Statler-Biltmore Hotels, Los Angeles, June 13-16, 1955.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
Committee on Petroleum, Conference on Electrical Applications in Petroleum Industry, Mayo Hotel, Tulsa, Okla., Sept. 27-29; Middle Eastern District Meeting, Abraham Lincoln Hotel, Reading, Pa., Oct. 5-7; Fall General Meeting, Morrison Hotel, Chicago, Oct. 11-15; Winter General Meeting, Hotel Statler, New York, Jan. 31-Feb. 4, 1955.

INTER-INDUSTRY FARM ELECTRIC UTILIZATION COUNCIL
Chairman, Fred H. Strong, REA Deputy Administrator. Meetings: Western Area, Shirley-Savoy Hotel, Denver, Colo., Sept. 28; Northeast Area, Deshler-Hilton Hotel, Columbus, Ohio, Oct. 12; Southwest Area, Texas Hotel, Fort Worth, Tex., Oct. 15; Southeast Area, Andrew Jackson Hotel, Nashville, Tenn., Oct. 20.

INSTITUTE OF RADIO ENGINEERS
Professional Group on Industrial Electronics and Pittsburgh Section of IRE, Symposium, Mellon Institute, Pittsburgh, Pa., Sept. 29-30.

INTERNATIONAL ASSOCIATION OF ELECTRICAL LEAGUES
19th Annual Conference, Bellevue-Stratford Hotel, Philadelphia, Sept. 29-Oct. 2.

STANDARDS ENGINEERS SOCIETY
1st Annual Meeting, Symposium of Integration of Government and Industry Standards, Haddon Hall, Atlantic City, N. J., Oct. 1-2.

NATIONAL ELECTRONICS CONFERENCE
10th Annual Conference, Hotel Sherman, Chicago, Oct. 4-6.

NATIONAL ASSOCIATION OF ELECTRICAL DISTRIBUTORS
Pacific Zone Convention, Mark Hopkins Hotel, San Francisco, Oct. 4-7.

INDIANA ELECTRIC ASSOCIATION
Annual Convention, French Lick Springs Hotel, French Lick, Ind., Oct. 6-8.

MISSOURI VALLEY ELECTRIC ASSOCIATION
Sales and Rural Conference, President Hotel, Kansas City, Mo., Oct. 6-8; Industrial and Commercial Sales Conference, President Hotel, Kansas City, Mo., Feb. 3-4, 1955; Engineering Conference, President Hotel, Kansas City, Mo., March 23-25, 1955.

(*Continued on page 60*)

Mechanism Records Meter Readings

Portable transcriber utilizing mark sensing provides the automatic input to mechanical accounting system, eliminates key-punching and speeds billing. Coding permits narrow tape for customer information, readings

KENNETH E. IVERSON, Instructor in Applied Mathematics, Harvard University, Cambridge, Mass.

A portable transcriber for recording meter readings has recently been developed on an experimental basis to provide an automatic input to mechanical accounting systems and hence to reduce office key punching and speed the preparation of customers' bills.

Special recording devices have received little attention in the past, primarily because the simple method of pencil and paper offers speed, accuracy and low cost which can hardly be surpassed when the subsequent accounting is performed manually. However, the increased use of mechanized accounting makes it desirable to record the original reading in some form which may be read mechanically and so eliminate a large amount of key punching.

Investigations leading to the design of this transcriber were supported by the Office of the Controller of Cleveland Electric Illuminating Co, Cleveland, Ohio, and were conducted at the Computation Laboratory of Harvard University, Cambridge, Mass.

To justify its use by a utility company, a transcriber must meet the following requirements:

1. It must produce a mechanically readable record;

2. It must be light and easy to carry, quick and easy to use;

3. It must permit a limited sorting of the accounts by the meter reader;

4. It must permit proofreading and correction by the meter reader;

5. It must provide all data such as street address, meter number, etc, as required by the meter reader;

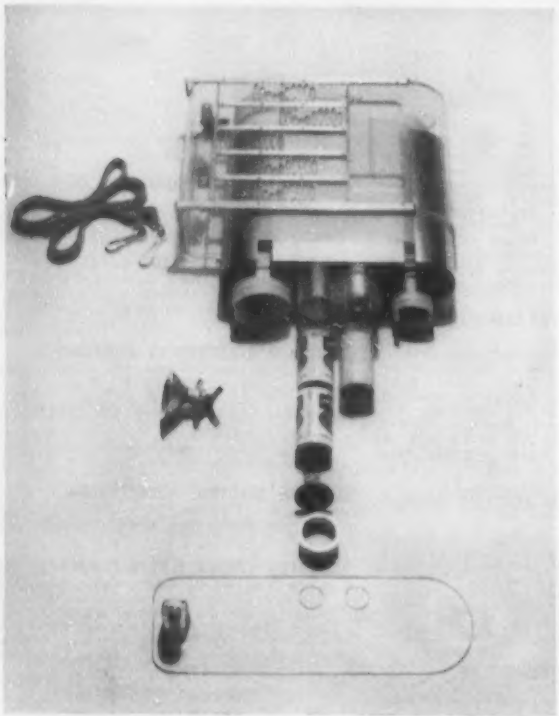
6. It must be cheap to produce in limited quantities.

Any method of recording may employ either tapes or cards. A tape offers important advantages in easier handling and less bulk, and may be scanned quickly enough for the present purposes. Since a tape cannot get out of order, it is unnecessary to punch account numbers as in cards. Instead, the reader's information for each account is simply printed in a single line on the tape in the normal route order. Each meter reading is then recorded between successive entries in the same order.

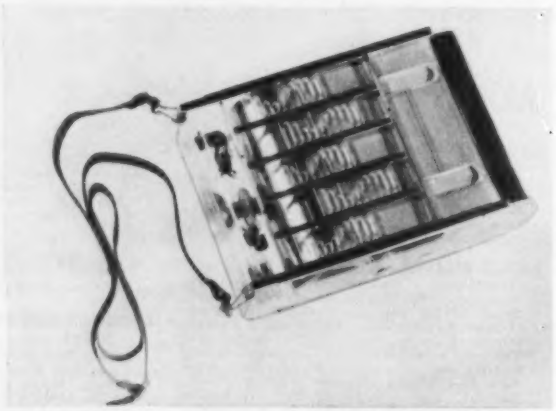
Mark sensing costs and weighs less than other methods of recording. Its major disadvantage lies in the care it requires of the operator in posi-

(*Continued on page* 25)

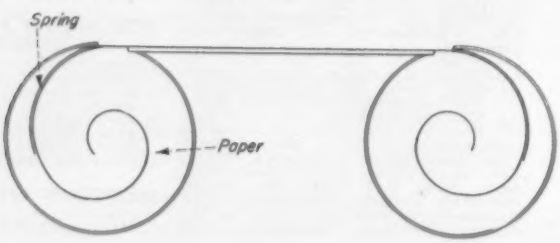
MODEL TRANSCRIBER has an outer case of ⅛-in. lucite, and four lucite tubes contain flashlight batteries, spare tape and the pencils



FLASHLIGHT HEAD and carrying strap are conveniences for the meter reader, and the large window is provided for rapid scanning of tape



CYLINDRICAL RECEIVERS and strips of light spring brass force paper into rolls. With suitable paper, 15-ft. lengths may be used.



All it takes are heat, water, and a pot. It's as simple as that, at least for tea, vegetables, and soft-boiled eggs.

But take this same principle with the same elements and apply it to the insatiable appetite of American industry for power. How big do the "pot" and "stove" have to be to boil 200,000 gallons of water in an hour, at thousands of pounds pressure, with temperatures over 1000 F, using any fuel from lignite to natural gas?

The answer is plenty big – often bigger than a 15-story building. And, along with that, the little lady in the apron becomes a corps of power engineers whose task it is to design, build, and operate these fantastically efficient boilers for the conversion of heat into usable power.

The light, heat and power needs of America are great and ever-growing – a growth that, at B&W, is being fed by *engineering*. Higher pressures, increased temperatures, the winning battle for more heat from less fuel – are the problems that must be solved and *are* being solved.

B&W developments like Cyclone Steam Separators, coal pulverizers, advances in oil and gas firing, Cyclone Furnaces, pressure firing, high-temperature alloy steels, shop-assembled steam generators, and waste heat boilers and similar heat recovery equipment are advances in the generation of power that cut bigger jobs down to size.

So today, as yesterday, B&W engineers turn their talents to finding better ways to "boil water" – to fill tomorrow's greater power needs for all America.

BABCOCK & WILCOX
BOILER DIVISION

N-186

One-piece smoothly finished aluminum hood for handsome appearance, rigidity, light weight.
Automatic latch snaps closed when glassware is pushed up; spring pressure keeps refractor tight against hood, assuring a bugproof, dustproof, and weatherproof seal.
Choice of types III or IV asymmetric light distribution, merely by changing glassware. Design assures uniform brightness across the entire glass area, minimizing hot spots and glare.

L-M's New Ovalite Puts Mercury Vapor Light Where You Need It

Improved luminaire provides choice of types III or IV distribution; one-piece aluminum hood; automatic spring latch.

By **STACY STANDLEY**
Manager of Lighting Sales
Line Material Company

L-M's new, improved Ovalite offers several design features that make the Ovalite the preferred choice for mercury vapor street lighting.

The hood is a smoothly finished one-piece aluminum casting that completely houses the Alzak aluminum reflector—which is also one-piece. This hood provides strength and rigidity, with light weight and fine appearance.

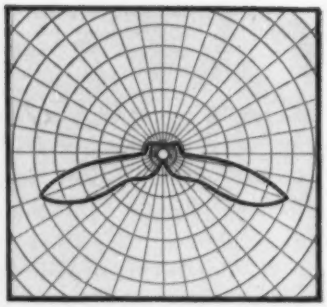
The new design provides a choice of types III or IV light-distribution patterns, by simply changing the glassware. This selection of light patterns requires a minimum stock of parts.

The latch snaps shut automatically when the refractor is pushed up. The refractor swings wide open on the house side, for easy relamping. Both the latch and the hinge apply spring pressure to the refractor, assuring a bugproof, dustproof, and weatherproof seal.

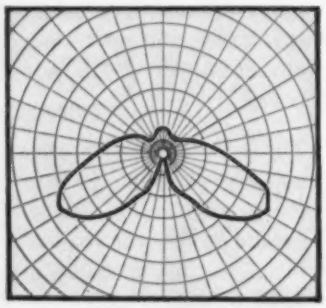
Takes both incandescent and types C-H5, A-H1, E-H1, and J-H1 mercury vapor lamps in horizontal position. Reflector extends down into the refractor, so there is no trapped light at the glassware junction. Deflector on the house side increases the coefficient of utilization on the street side. Lamp position adjustable for light-center differences. All hardware stainless steel, or non-ferrous.

Get Complete Information

Ask the L-M Field Engineer or Lighting Engineer for information on the new L-M Ovalite, and on L-M's Lighting Engineering Service; or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).



Type III light distribution, for wide lateral distribution on medium-width streets.



Type IV distribution, also available with the Ovalite, used for wider streets.

LM 190 **LINE MATERIAL** *Street Lighting*

"Ovalite" is a Line Material Company trademark

A Fluorescent Community is a Progressive Community. L-M fluorescent lighting means fewer accidents, less crime, more business.

L-M's New Fluorescent Street Lighting Luminaire
Large Light Source, Minimum Glare

By **STACY STANDLEY**
Manager
Lighting Sales
Line Material Company

L-M's New Fluorescent Luminaire is a revolutionary improvement in street lighting. With its large light source the fluorescent luminaire produces an even, cool white color over a large area. Because of its large light source, it provides virtually glareless illumination.

Fluorescent luminaires provide a light that is particularly advantageous in business and shopping sections. The surrounding sidewalk area adjacent to the curb is illuminated and gradually fades out to make the background contrast as gradual as possible. This provides a wider scope of vision for both the motorist and the pedestrian, in addition to creating a cheerful and active atmosphere in the shopping area.

L-M's New Fluorescent Luminaires are available in these styles:

1 4-lamp V-shape for use on wide streets

2 4-lamp bi-directional tilted 20° toward the street for narrower streets and entrance ways

3 4-lamp bi-directional with level horizontal mounting for center parkway and area lighting

4 2-lamp uni-directional for underpass, flood lighting, perimeter and ramp lighting

The fluorescent lamp used in these luminaires has a rated lamp life of 7500 hours. This longer lamp life reduces the cost of relamping luminaires below any other type now used for street lighting.

Features of L-M's New Fluorescent Luminaires

Large light source • Even, cool white color • Minimum glare • Low power consumption • Longer lamp life

Separate efficient reflecting system for each lamp • Good vertical component across the whole surface of the street • Good balance between building and road surface

Two lamp ballasts • Easy accessibility for relamping • Wiring terminal block easily accessible • Ballast can be removed very simply • Bracket adjustable ±5° for leveling.

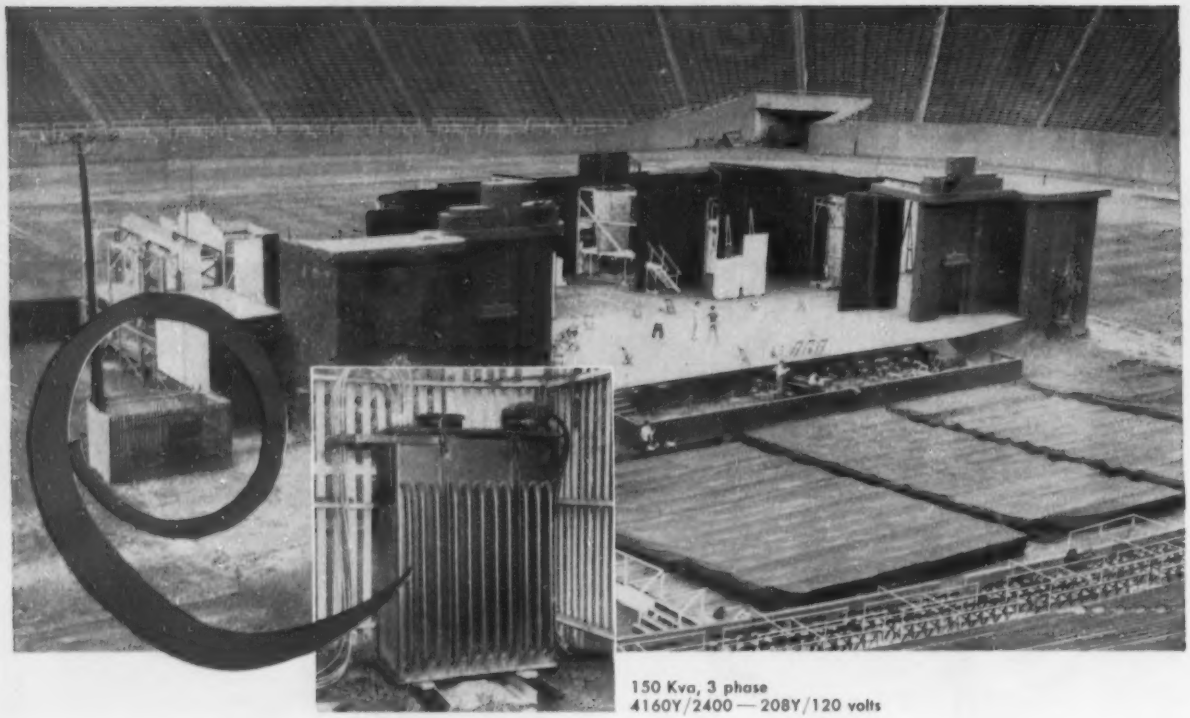
L-M's fluorescent luminaires are easily accessible for cleaning, relamping, wiring terminal block and ballast removal. Four-lamp unit has two ballasts with one tube on either side of the luminaire paired to each ballast. Thus, if one tube burns out, the light output of the luminaire is reduced only 50% in each direction. Also, if desired, two lamps could be switched off for part night circuits.

Get Complete Information

Details of the new L-M fluorescent luminaires are available. Ask the L-M Field Engineer for information, or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

LINE MATERIAL Street Lighting

196-2

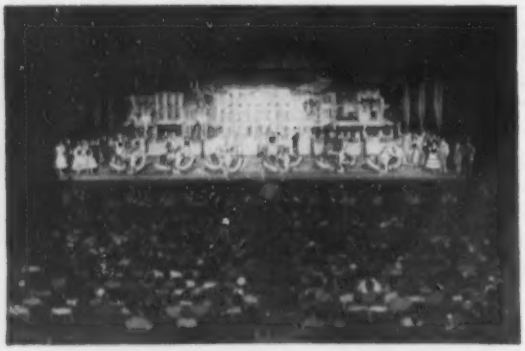


150 Kva, 3 phase
4160Y/2400 — 208Y/120 volts

POWER for the Pittsburgh Civic Light Opera

distributed by a

PENNSYLVANIA POWER PAC TRANSFORMER



PENNSYLVANIA TRANSFORMER COMPANY

A McGraw Electric Company Division

CANONSBURG, PENNA.

FOR the past three summers, Duquesne Light Company has used a Pennsylvania Power Pac transformer to supply power for the Pittsburgh Civic Light Opera presentations at Pitt Stadium. Because of its versatility, small size, and light weight, the Power Pac is ideal for temporary service.

The Power Pac may be designed for three phase only, if three phase at utilization voltage can supply both power and lighting loads. If a customer requires both three phase and single phase power, then a combination three phase/single phase unit may be supplied.

This pre-assembled, single tank unit is suitable for either individual or multiple customer service with adequate provisions for metering where needed.

In addition to simplified installations and reduced labor costs, Power Pac advantages include greater safety to operating personnel, reduced vault space requirements, and less wiring expense.

For complete information on the Power Pac assembly, write to Distribution Sales Department, Pennsylvania Transformer Company, Box 330, Canonsburg, Pa., and ask for Bulletin No. 8534.

Transcribes

(*Continued from page* 20)

tioning the mark for proper registration. A mask or stencil helps in pencil-marking the tape accurately.

Mark Sensing . . . The simplest mark-sensing procedure would use a mask of 50 vertical slots across the width of the tape, one to each decimal digit in each of five columns, resulting in a very wide tape. Tape width, however, may be considerably reduced by coding each decimal digit as a combination of four binary digits. Each of the five columns is represented by a single transverse line on the tape, the particular decimal digit being indicated by the positions of the two ends of the line.

Limitation to a single continuous line provides speed and ease of recording. A further practical restriction is the arrangement of the reading device so that the current flow from any brush passes only to an adjacent brush, avoiding current flow through long sections of the graphite mark.

The above considerations led to the coding scheme presented in Fig 1, in which the two positive brushes furnish power to the remaining four brushes through connections furnished by the pencil marks. The number N of codes available in such a system (excluding the case of no mark) depends as follows on the number n of negative brushes used:

$$N = \sum_{k=1}^{n} k = \frac{n(n+1)}{2}$$

Thus four negative brushes provide ten codes which may be assigned to the decimal digits in any desired way. This particular scheme was chosen for appearance only.

For reasons of speed and accuracy, the coding operation cannot be left to the operator. But it may be accomplished by providing five sliding stencils, each with slots corresponding to the coding scheme in Fig 1. The tape passes under a flat cover provided with a single continuous slot across the width of the tape. The stencils are carried on this cover and are allowed to slide in a direction perpendicular to the slot in the cover. By inserting a pencil in any desired digit, moving the sliding stencil either up or down until the pencil drops into the slot in the cover, and moving it to the left or right as far as it will go, the appropriate mark on the tape is obtained.

Proofreading . . . Besides being very fast, the process allows proofreading. Proofreading is obtained before marking by adding a line of holes, one beside each slot in the slide. The main slot in the cover beneath these holes is cut only part way through so that the sliding stencil may be positioned by means of these holes without marking the tape. Use of sliding stencils may be applied equally well to the operation of punches.

While a sprocket roller with detent and two spring loaded take-up rollers could position the tape, these moving parts would probably constitute the major cost of the device. The take-up roller may be replaced by cylindrical receivers, as shown on pg 20. The strip of light spring brass in each cylinder forces the paper into a roll of somewhat reduced radius and prevents binding. With suitable paper, lengths up to 15 ft may be handled satisfactorily. Allowing $\frac{1}{3}$ in. per entry, nearly 500 readings may be recorded on the tape, enough for the average route. Spare rolls may be carried.

The sprocket roller is dispensed with by providing a thumb slot through which the operator may move the tape so that the printed information is correctly positioned relative to marks provided in the window. Such positioning will be less accurate than that provided by a sprocket roller, but accurate positioning is not required when the marks themselves are used to provide the "clock" impulse for reading. Errors arising from missing readings could be prevented either by a visual scan of each tape in the office or by setting an upper limit to the amount of tape to feed between successive readings. This limit, set at somewhat less than twice the normal length between readings, would act to halt the reading process. Readings not obtained because of "locks" would not be considered missing in the sense used here, but would be indicated by a special mark, such as, a zero in the lowest order column only.

Experimental Model . . . A transcriber combining this method of tape transport with mark sensing by stencils would be cheap to construct, light and easy to use, and would generally satisfy the requirements. The experimental model shown in the accompanying photographs consists of an outer case formed from a single sheet of $\frac{1}{8}$-in. lucite, one side being permanently closed and the other capable of being closed by a snap cover of the same material.

The paper receivers are 3-in. brass tubes silver soldered to the flat sheet of brass backing the active section of the tape. Four lucite tubes carry flashlight batteries, spare rolls of tape and pencils. The top of the lucite case has a horizontal slot for mark sensing and larger thumb slots for moving the tape. Stencil slides are carried in aluminum guides with a light friction spring. The flat section below the guides serves as a window for scanning and positioning the tape. Illumination of the window and slides is provided by edge-lighting the lucite case with two flashlight lamps.

An ordinary flashlight head slipped into the forward end of the case replaces the flashlight carried by the operator, and all three lights operate from a single toggle switch. Two tubes containing two dry cells each may be operated in parallel, or alternately, and one tube may be reserved for spare batteries.

(*Continued on page* 27)

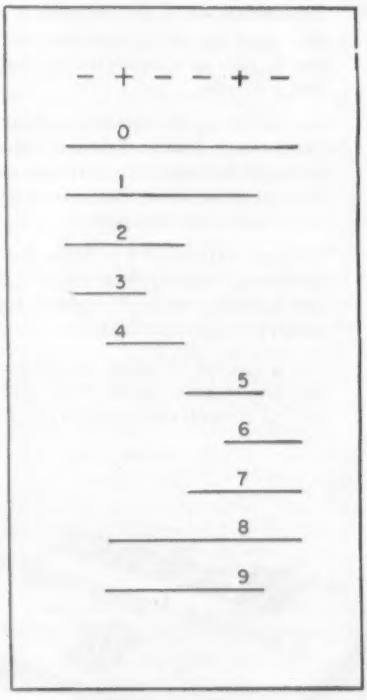
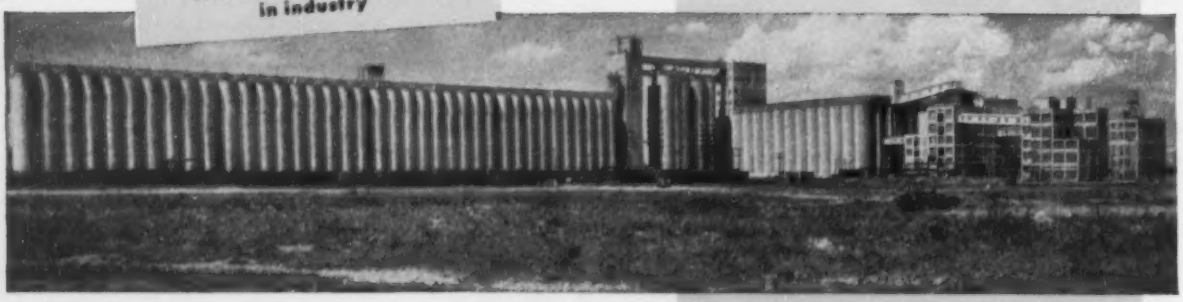


FIG 1—CODING SCHEME reduces the tape width which is required for recording data

Wagner
ELECTRICAL PRODUCTS
...the choice of leaders in industry



Look what's happened to "Green Manure"

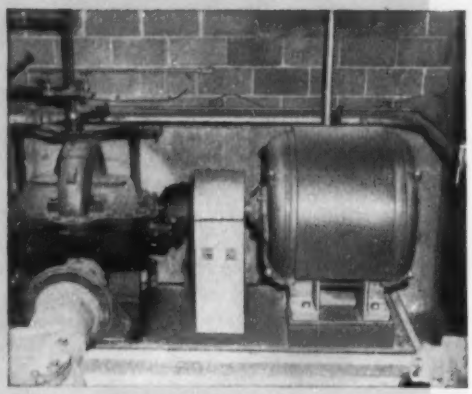
America's most rapidly increasing crop is the soybean. Just 30 years ago, soybeans were called "green manure"—considered of value only as a soil-building legume. But, today, soybeans are our fourth ranking grain crop... more than a quarter billion bushels were harvested last year.

The A. E. Staley Manufacturing Company, at Decatur, Illinois, is the world's largest combined processor of corn and soybeans. At the giant 108-building plant shown above, soybeans are converted into soybean oil and meal... to become a major ingredient in scores of products from shortenings and margarines, stock feeds and medicines to paints, plastics, textiles and linoleum.

Electricity is, of course, the source of power for this processing. And at the Staley plant, power is supplied through Wagner Transformers—delivered to Wagner Motors that drive the conveyors, agitators, flaking rolls and other equipment.

Wagner Electrical Products are the choice of many leaders of industry because Wagner has a reputation for building quality products that do their jobs dependably and economically.

Let a skilled Wagner engineer discuss your motor and transformer needs with you. Call the nearest of our 32 branch offices, or write us direct.



This 150 hp Wagner Type RP Motor drives a cooling tower pump at the A. E. Staley plant.

This 750 kva Wagner Substation Transformer is fed from a substation containing two 5000 kva Wagner Power Transformers.

Wagner Electric Corporation EST. 1891

WAGNER ELECTRIC CORPORATION
6456 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

WE54-7

Transcriber

(*Continued from page* 25)

The tape is almost completely covered, and the thumb slots are so placed that contact with the area of the tape carrying pencil marks is avoided. The transcriber is carried by straps so placed that the top face is protected against the reader's body. Preparation of the tape is simple, requiring printing only. Sprocket holes may be added in any of the four areas not used for marking. The 6⅝-in. tape allows printing of as many as 60 characters, sufficient for the information required by the reader. The large window permits rapid scanning.

Operation . . . Information concerning a meter is brought into position, the meter located and its number checked, and the reading recorded and proofread. The slides, however, may be set first and proofread before the mark is made. While a slot for erasure could be provided, it has been omitted because of the possible effect of eraser crumbs moving on the face of the tape. An error is corrected by marking zeros in all columns and writing the correct reading in the thumb slot in the corresponding printed line. The reading device is then programmed to stop at any reading made up of zeros, and the machine operator introduces the correct numbers indicated in writing. Such operation causes an unnecessary stop on any correct reading happening to be zero, but the expected frequency of such stops is only two or three times per year.

Some utilities require meter readers to compute consumption and check it against previous consumption. When the transcriber is used, the previous month's reading and average consumption are not part of the reader's information. The expected reading is printed instead, and his check consists of comparing the slides' setting against this expected reading. To prevent "curbstone" reading, the instrument may be programmed to falsify deliberately a certain number of expected readings each month to determine whether the readings were double-checked by the readers.

It is believed that the above techniques may be useful in fields other than the reading of electric, gas and water meters, possibly by milk, bakery and other route salesmen.

'Project Shower'

Extensive study into causes of rainfall planned for Hawaii. Top scientists to participate

Probably the most extensive research project into what causes rainfall is planned for the Island of Hawaii in October and November of this year. Scientists from all parts of the world are preparing to engage in the cooperative venture which they hope will unlock the secrets of rainfall formation, possibly leading to rainfall control.

Wide Participation . . . Among scientists taking part will be Dr E. G. Bowen, co-inventor of radar; Dr John Warner and Patrick Squires of the Commonwealth Scientific and Industrial Organization of Australia; Alfred H. Woodcock, Duncan G. Blanchard, and Theodore Spencer of the Woods Hole Oceanographic Institution, Woods Hole, Mass.; Dr E. Erikson of the Swedish Meteorology Institute, Stockholm; Dr Christian Junge of the Air Force Research Laboratories, Cambridge, Mass.; and Dr Vincent Shaeffer, formerly of the General Electric Laboratories, noted for his work in cloud-seeding. About thirty scientists and technicians will be engaged in the project, representing seven organizations, including the U.S. Weather Bureau.

Preliminary arrangements for the study, labelled "Project Shower," are being made by Lt Cmdr Charles E. Palmer of the Geophysical Section of the Offices of Navy Research, Woodcock, and W. A. Mordy, head of meteorology department sponsored mainly by the Hawaiian Sugar Planters' Association Experiment Station, the Pineapple Research Institute of Hawaii, and the Territorial Cattlemen's Council.

Why Hawaii . . . Mordy explains it as follows:

"The reason for bringing together such a group of prominent people to study Hawaii's rainfall is that Hawaii offers an opportunity to study rainfall conditions which are unequaled elsewhere. The results of the work can be applied not only to island rainfall conditions but everywhere.

"Hawaii's mountains which present an obstruction to the ever present trade winds produce a number of regions of very heavy rainfall, and the almost daily occurrence of rain in these regions means that the scientists 'go to the weather' rather than waiting for the weather to come to them, as in most other regions.

"The Royal Australian Air Force is planning to bring to Hawaii an aircraft equipped with thousands of pounds of special scientific apparatus for making measurements in clouds. Aircraft equipped by the Hawaiian research teams will be used to supplement these observations. Measurements will be taken of the chemical constituents of different size raindrops, of the size and distribution of tiny water droplets in clouds, of the number and distribution of the tiny nuclei on which rain droplets form, and of the electrical properties of the tiny cloud and water droplets.

"In general the idea is to get as much detailed information as we can at one time of all the factors which contribute to rainfall in a given locality. Following the project we hope to fit together the pieces of knowledge of just what happens when rain forms."

University of Washington Conducting Fish Studies

University of Washington School of Fisheries, in a $120,000 project financed by the Army Corps of Engineers, will seek to determine how swift a river current can be before it offers an insurmountable obstacle to a salmon upstream-bound for his spawning grounds.

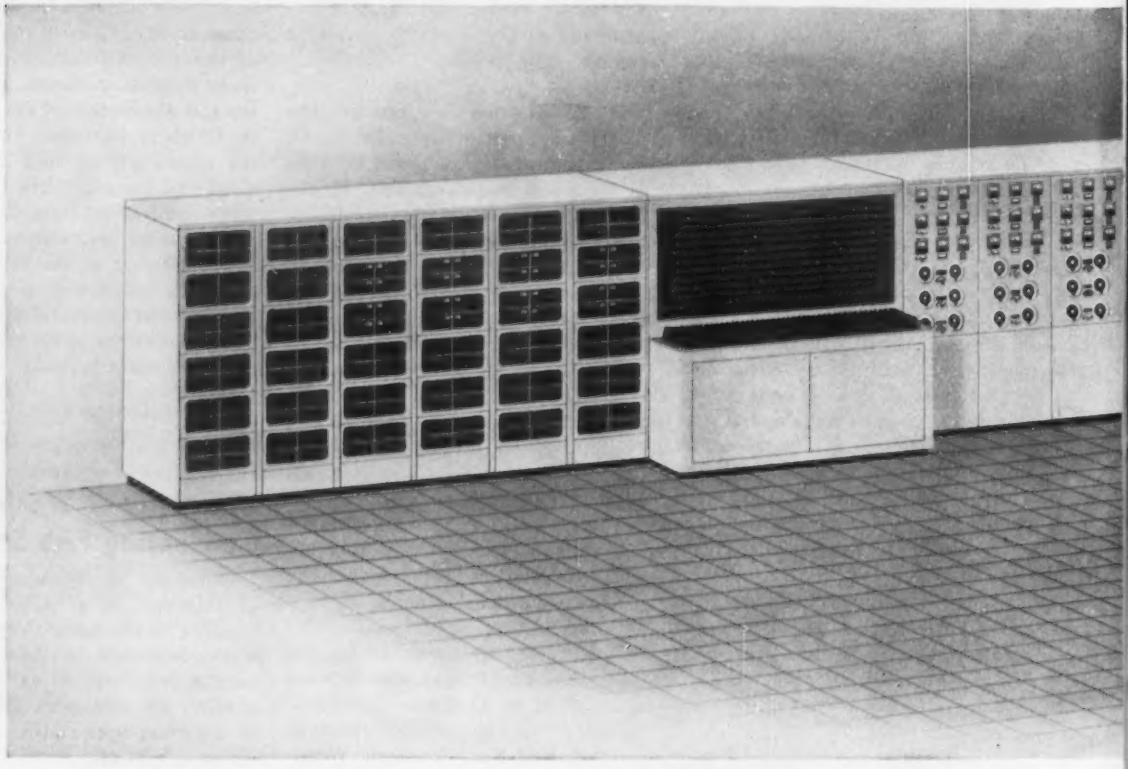
A glass flume, 24 ft long, has been built at the school's Fisheries Center, adjoining Lake Washington Canal in Seattle, to allow both fast and slow currents to be tested simultaneously. Biologists will seek to determine the limit of a salmon's endurance in seeking to breast a strong current.

In other phases of the two-year project, studies will be made on the effects of using electricity or other methods to guide salmon and steelhead trout past dams in both directions.

Feasibility of using electricity will depend upon the casualties which might be inflicted upon the fish, said Leon Verhoeven, biologist in charge of experimental work at the Fisheries Center.

Another service for industry

I-T-E now offers a complete line



I-T-E System Analyzer, with console metering desk, arranged for 21 generators and approximately 450 circuit components.

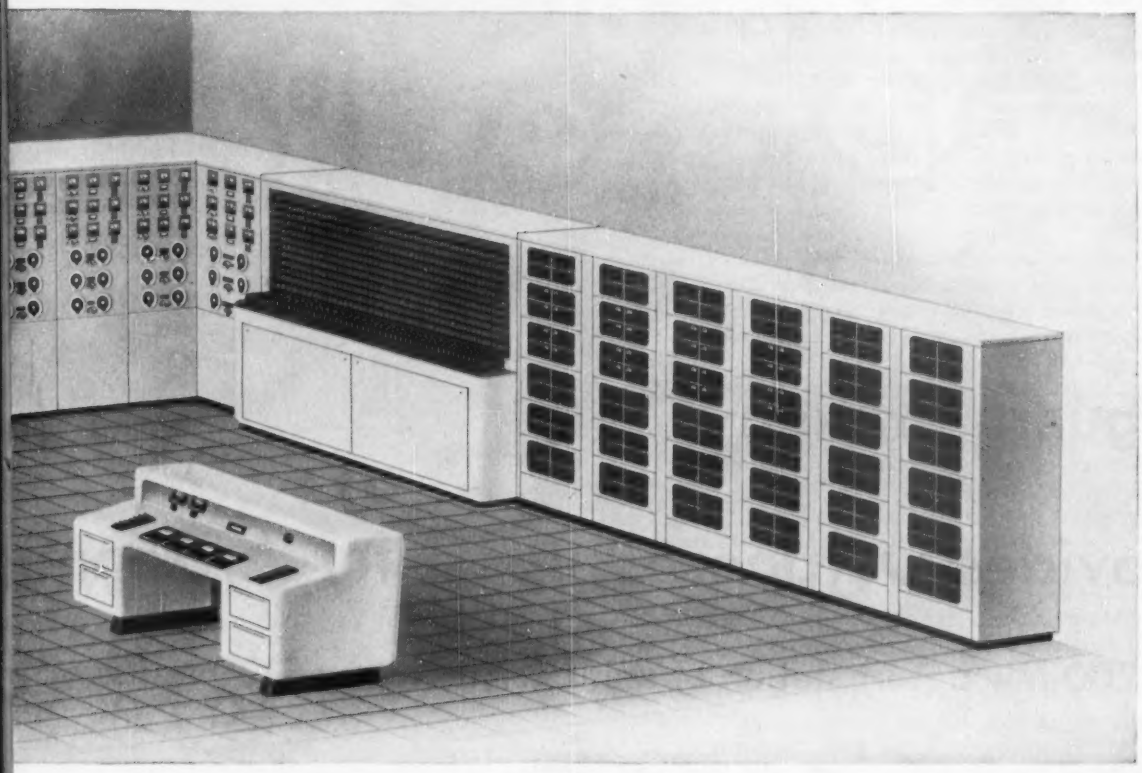
I-T-E continues to support America's greatest electrical expansion

KWHR capacity has doubled in the last ten years. Present trends indicate another doubling in the decade to come. More effective equipment for system planning, as well as new power-generation, transmission, and distribution equipment, will be required to handle this vastly increasing capacity.

Recognizing the need for more effective planning equipment, the I-T-E Circuit Breaker Company is making available a complete line of power system analyzers, designed for utmost accuracy and speed of operation. These analyzers provide solutions to system problems resulting from rapid growth and interconnections, and afford studies otherwise too difficult because of limited technical manpower and time. These units incorporate features covered by the patents and latest designs of Professor E. B. Phillips, University of Kansas.

I-T-E thus continues to support industry by providing more products, broader lines, and increased production of the finest-quality equipment.

# of POWER SYSTEM ANALYZERS



- 60 CYCLE POWER SUPPLY
- GREATER ACCURACY
- FASTER OPERATION
- COMPACT DESIGN
- MINIMUM MAINTENANCE
- SIMPLIFIED INSTALLATION

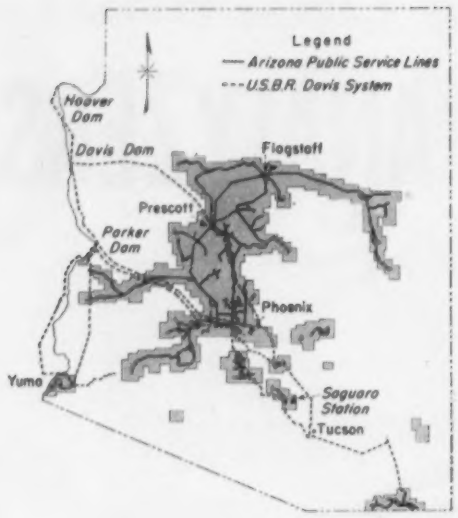
For details, contact the I-T-E Field office nearest you. Look in your Classified Directory under "Electric Equipment."

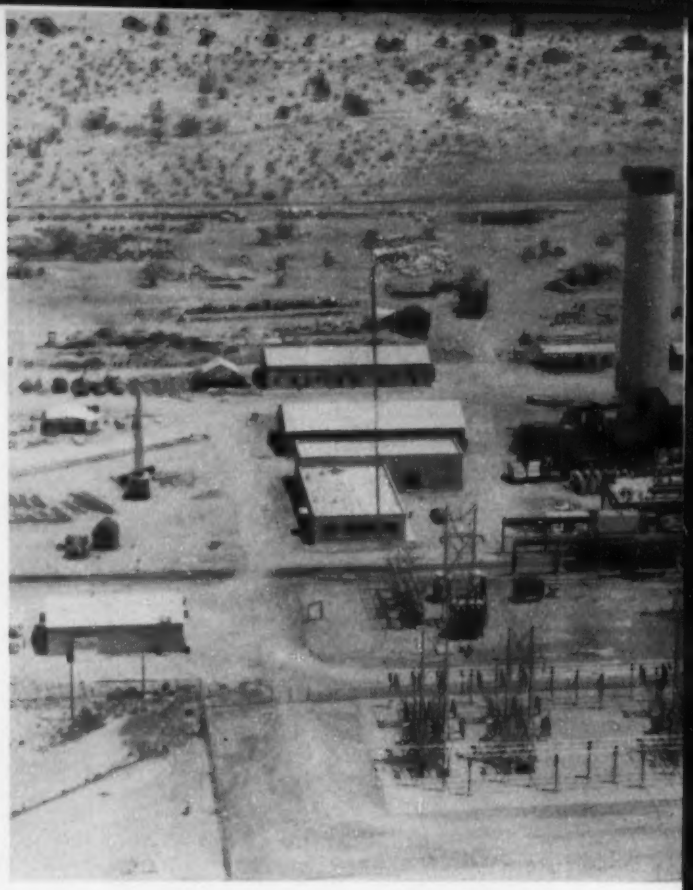
The Symbol of Quality Switchgear

I-T-E CIRCUIT BREAKER COMPANY

19TH AND HAMILTON STS., PHILADELPHIA 30, PA.

SYSTEM ANALYZERS

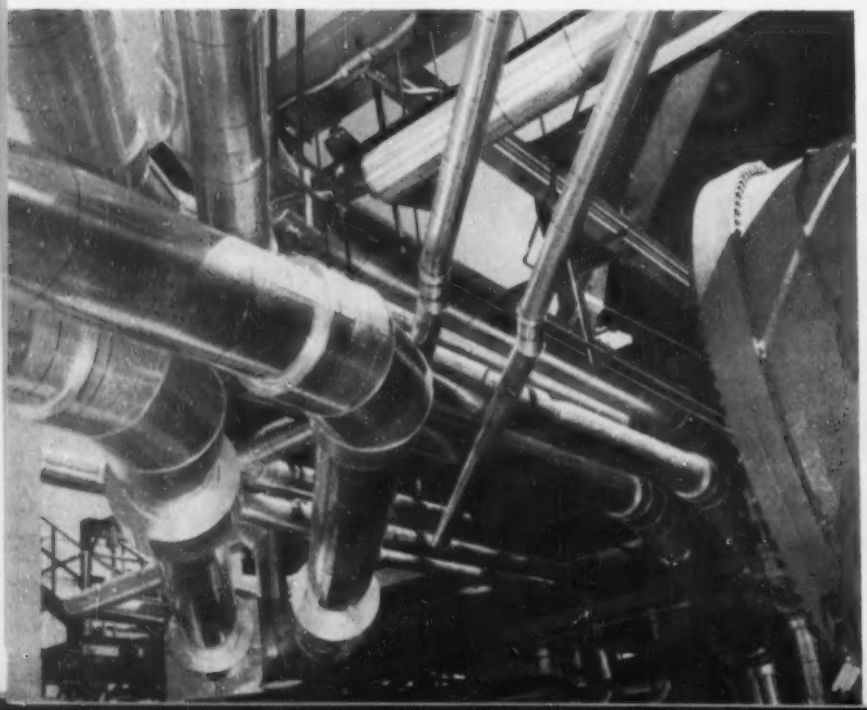


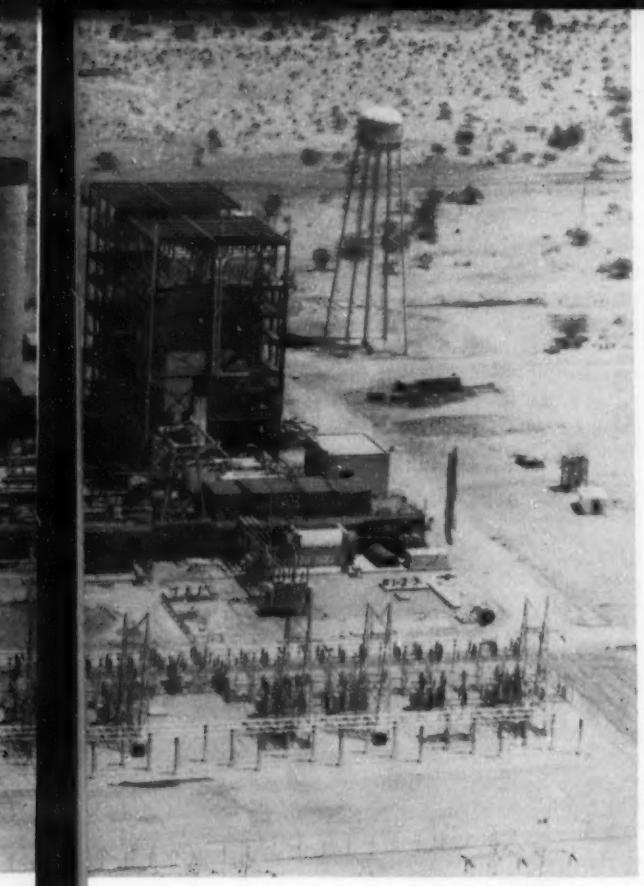


Saguaro Station

Provides Outdoor Outpost for Arizona

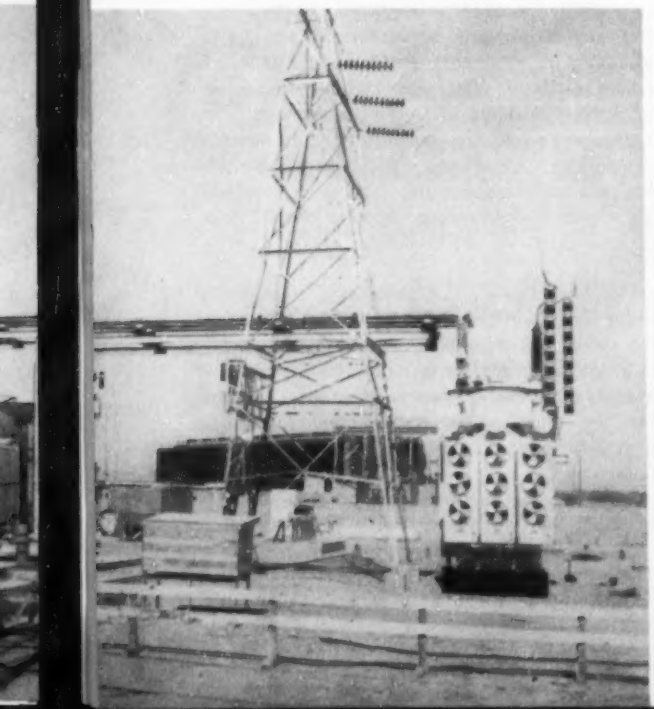
200-Mw desert station of unit design costing $120 per kw,





System

run by crew of four



WALTER T. LUCKING, General Supt, Power Supply, Arizona Public Service Co, Phoenix, Ariz.

Operating efficiency of its power supply facilities stands to be improved to a marked degree now that Arizona Public Service Co has placed the first unit of its outdoor, 200,000-kw Saguaro Station in operation. Location of the station in southern Arizona will also benefit the transmission network serving the entire state. Saguaro will consist initially of two 100,000-kw units that are expected to operate at an annual load factor of about 70%. The first unit went on the line in July. The second unit is scheduled for service in February 1955.

Plant Will Be Largest in Arizona . . . When completed, Saguaro will be the largest steam-electric station in Arizona. The arrangement of the plant site provides space for the addition of two units 100,000-kw or larger. Saguaro is designed as a completely outdoor installation with the only equipment housed being the walk-in enclosure over the head and exciter ends of the turbine. The control building, warehouse, and the service building are the only building enclosures.

Housed in the service building are the offices, laboratory, change room, machine shop, and electrical shop. The decision for an outdoor plant was based on the favorable experience gained at the company's Phoenix plant.

Duplication Brings Savings . . . Equipment throughout the station is duplicated for both main units to effect considerable savings in engineering and installation expense. Cost of Saguaro is estimated to be $120 per kw of capability initially. This estimate includes the cost of all improvements at the site, including high-voltage equipment and switchyard.

Turbines are 90/99-Mw, preferred standard, tandem-compound, double-flow, 3,600-rpm machines with design conditions of 2.5-in. Hg back-pressure, five-stage extraction, and 1,450-psig, 1000-F steam. Maximum steam flow to the turbine inlet is 817,000 lb/hr. Generators are rated at 100,000 kw, 117,647 kva, 85% power factor, 4,382 amp, 15.5 kv, and 0.8 short circuit ratio. They are hydrogen cooled with a reduction-gear-driven 350-kw, 375-v exciter driven off the main shaft at 1,191 rpm.

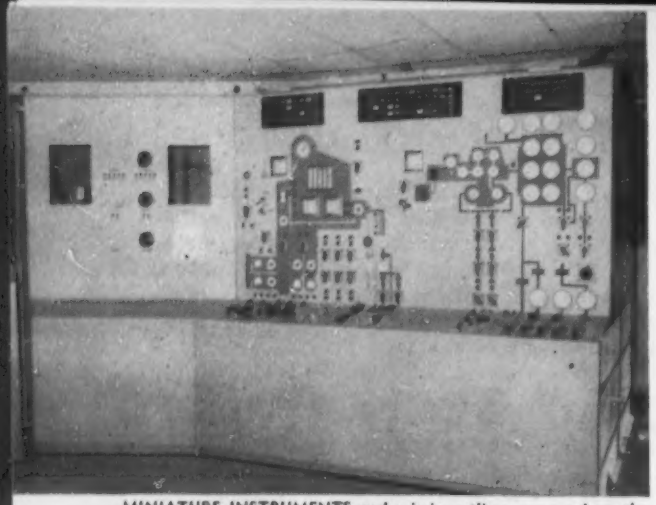
Main units will be serviced by an overhead gantry crane with a main 50-ton capacity hook and an auxiliary 10-ton hook. The craneway will be extended in the future so that the same crane can service the third and fourth units.

Condensers for each turbine are of the deaerating type, with two T-connected, two-pass shells, and non-divided water box. Total cooling surface is 75,000 sq ft. Condensing and service water is obtained from deep wells on the property. Wells are of sufficient capacity so that three will meet the requirements of full load operation, and a fourth well will be added for standby.

Condensing water will be cooled by two redwood,

GENERATOR LEADS run in isolated phase bus to a point beyond crane travel, then convert to open, insulated tubular bus

ALUMINUM-SHEET INSULATION (far left) is used for virtually all piping at Saguaro. Main steam lines are shown



MINIATURE INSTRUMENTS and mimic outlines are used on the turbine-generator control boards. Large holes (left) will take television receivers that aid in viewing the water level in the boilers

double-flow type cooling towers set in line over connecting basins. Design conditions are based on a 16 F approach to 70 F wet-bulb for a capacity of 70,450 gpm for each tower. Water will enter the tower at 102.6 F and leave at 86 F for these design conditions.

Condensing water flows from the towers through an open gunited channel to an intake chamber where two vertical circulating-water pumps for each unit are located. Vertical pumps for fire protection and service water also are in the chamber.

Heater Deck at Operating Level . . . Located on the heater deck at operating level and adjacent to the turbogenerator are the low-intermediate, intermediate, high-intermediate, and high-pressure, closed horizontal heaters. The fifth low-pressure heater is located in the exhaust connection of the condenser T-piece. One steel condensate storage tank will serve both turbine units. It has storage space to fill one boiler to operating level plus a 20-min supply for one boiler operating at full load.

For feedwater treatment, demineralizing equipment showed economic advantages over an evaporator make-up. The demineralizer will furnish make-up at 1-2 ppm total solids with 0.02 ppm silica content. The calculated pH of the feedwater make-up is 8 to 9. The equipment consists of a two-step demineralizing unit with a vacuum degasifier between the cation and anion units.

Feedwater will be supplied to the boilers by three, half-capacity, barrel-type feed pumps for each unit, direct-connected to motor drives. Each pump is designed for 1,155-gpm capacity of 320F water with 160-psig suction pressure and 1,850-psig discharge pressure at 3,570 rpm.

Economics Dictate L-Shape . . . Boilers are located so that Units 1 and 2 are adjacent and on a line perpendicular to the main turbogenerators in tandem to form an L-shaped configuration. No. 1 boiler is located next to the heater deck. No. 2 boiler is in line and adjacent. When the two additional turbogenerators are installed, they will be located on the center line of the first two units with their associated boilers directly opposite boilers 1 and 2.

The L-shape position of turbogenerators and associated boilers is based on an economic study that took into account the possibility of operation with pulverized coal in the future. Boilers have been elevated to provide for burning of coal. Space will be available between the initial and future boilers for overhead coal bunkers, pulverizers, and associated coal-handling equipment. In addition, sufficient land is available for the storage of up to 500,000 tons of coal immediately adjacent to the station.

Each steam generating unit is of the radiant type and has a continuous capacity of 900,000 lb/hr at a design pressure of 1,700 psig. Superheater outlet conditions are 1,550 psig at 1,005 F. The superheater is the continuous pendant type, with superheat control by automatic burner tilt and bypass damper. A continuous bulb-type counter-flow economizer is provided along with two air heaters of the revolving surface heat exchanger type. Each unit has two forced-draft fans and two induced-draft fans. Expected overall heat-rate is estimated at 11,000 Btu per kwhr, at 2.5-in. Hg back pressure and 83% boiler efficiency.

View Water Level by TV . . . Closed-circuit television is installed between the water column and control room as an additional aid in determining boiler water level. Provisions also have been made for the addition of television for viewing the boiler furnace. Castable refractory materials were used wherever possible throughout the steam generating units. One concrete and title-lined chimney is provided for the two steam units. This chimney is 20 ft in diameter, 160 ft high, and is arranged for future extension to 250 ft should coal firing be adopted. Natural gas will be the primary fuel with fuel oil as standby. A 55,000-bbl storage tank is provided with heating and pumping facilities.

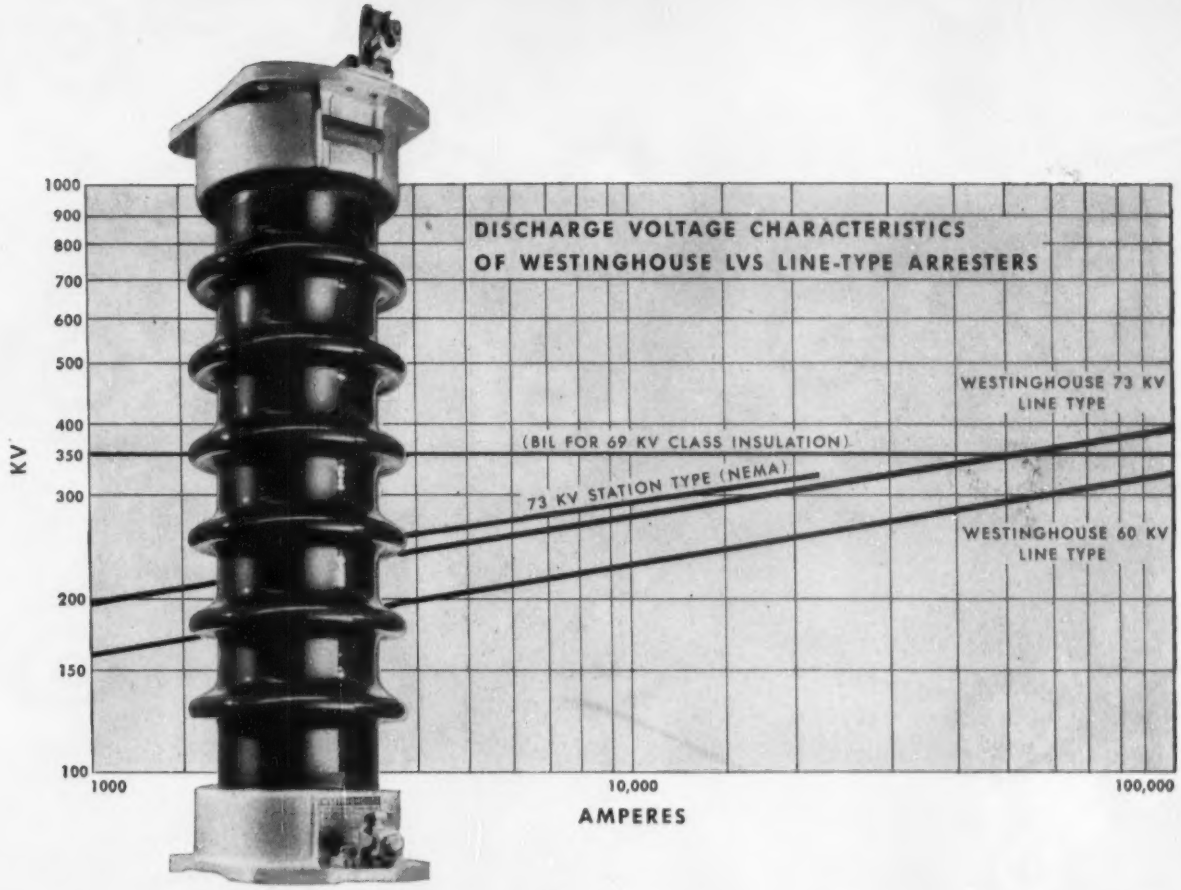
Aluminum Provides Insulation . . . Essentially all piping at Saguaro, plus portions of the boiler duct work, will be insulated by aluminum sheets. Layers of aluminum, the number depending on the need for insulation, are built up in parallel with an air space provided between each layer by spacers. This insulation is applied by mechanical fasteners. For an outdoor plant it was felt that aluminum-sheet insulation would withstand more satisfactorily skin temperatures up to 160F, encountered in the Southwest. Also, the elimination of periodic painting should reduce maintenance costs appreciably.

Auxiliary power to essentially all equipment is at 2.4 kv with the exception of all motors 300 hp and less which will be operated at 480 v. The auxiliary-bus arrangement provides for duplicate source of supply to the auxiliaries either from each unit's auxiliary transformer or the standby auxiliary transformer. All electric equipment and switchgear are designed and enclosed for outdoor service and for the high ambient temperature. Motors are of drip-proof design with filters on the air intake.

Bus Is Isolated, Then Open . . . One 3-phase main power transformer for each main unit is rated 140 Mva, FOA and 15.5/115 kv. Generator main leads are carried as isolated-phase buses from the generator terminals to a point just beyond the condenser and then run open on overhead structures to the main power transformer. Generator leads are tapped for service to auxiliary power transformers rated 7,500 kva OA and 15.5/2.4 kv.

Tubular aluminum bus mounted on post-type supports is used throughout the switchyard. Post-type construction

(*Continued on page* 36)



Now . . . wider application, greater economy with Westinghouse line-type arresters

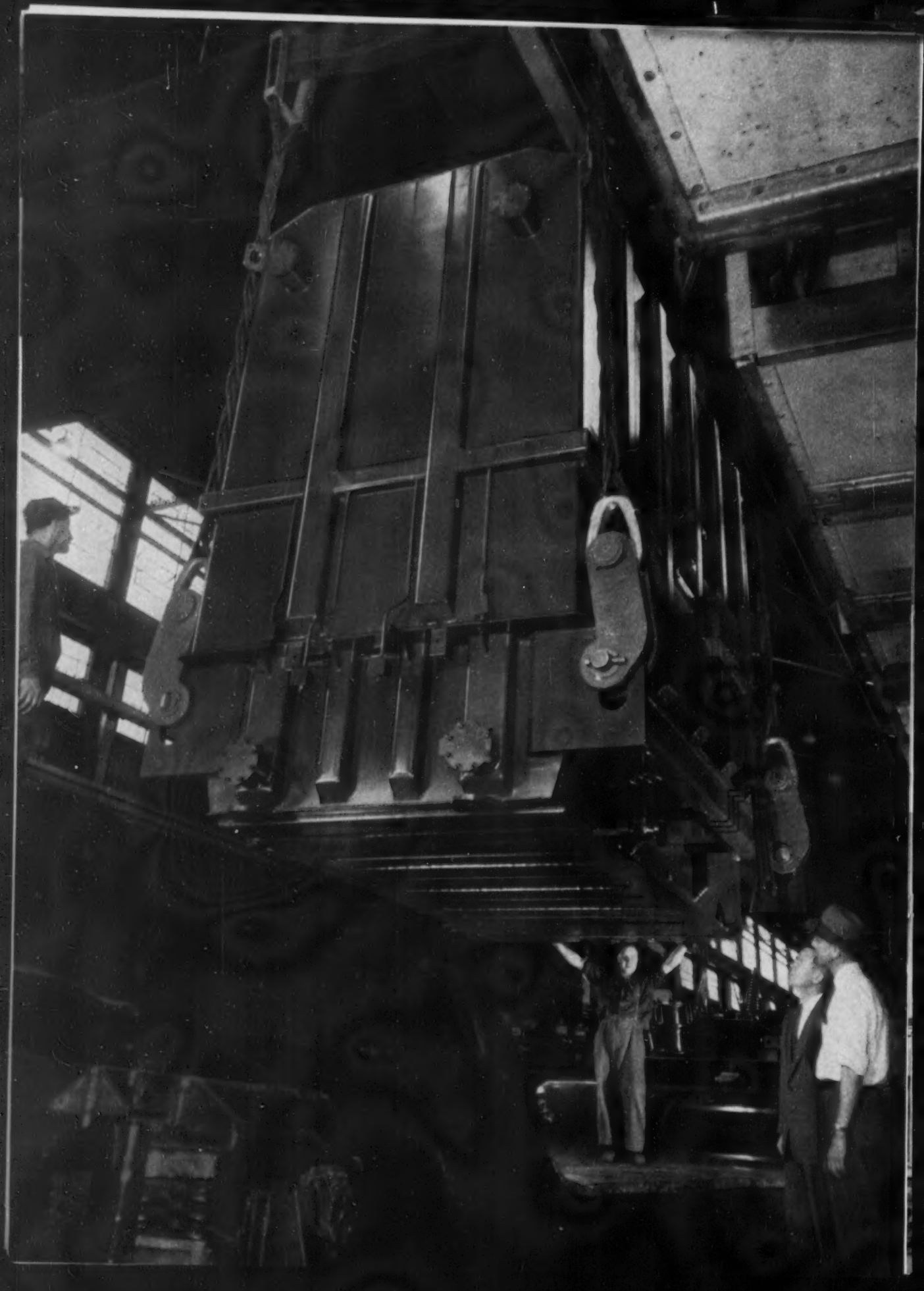
Charted above are the new, lower discharge voltage characteristics of Westinghouse LVS line-type arresters—now even lower than AIEE or NEMA published values for station-type arresters. Think of the savings this offers!

NEMA standards for station-type arresters specify a discharge current withstand ability of 100,000 amperes with a wave shape of at least 5 x 10 microseconds, plus a duty cycle test (combined surge and follow current) of 20 operations with a discharge current of 10,000 amperes crest and a 12 x 45 microsecond wave shape. These have proved excellent criteria for station-type arresters. *For more than a year, Westinghouse has used the same routine tests on LVS Autovalve® elements as on SV (station-type) elements.* Thus, the durability of station-type arresters is now available in less expensive LVS arresters.

In addition to superior characteristics, LVS arresters have two exclusive design features when compared with other line-type designs: solder-seal that solves forever the moisture problem, and pressure relief diaphragm that relieves severe gas pressures in event of damage to the arrester.

All these facts make this clear: for applications 73 kv and less, except for abnormal contamination and condition of large separation between equipment, Westinghouse LVS arresters offer the best protection per dollar. For still more facts, call your Westinghouse representative. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60871

YOU CAN BE SURE... IF IT'S Westinghouse



Helping the industry meet its growing loads

Setting transformer capacity records within practical size limits

The 220,000-kva Westinghouse Form-Fit Power Transformer, shown at left, is, by far, the highest rated unit built to date. Even so, its compact rugged construction permits upright shipment . . . in a single factory-assembled, sealed and tested unit.

Facing the problem of ever-increasing capacity required . . . versus transportation and handling facilities available . . . has been a Westinghouse specialty for years. Form-Fit construction has consistently provided the solution to this problem . . . setting new records in transformer capacity within practical size limits.

Even now, units of 315,000 kva are being built. These, too, will be shipped upright.

Form-Fit construction inherently provides the greatest mechanical, thermal and dielectric margins, thereby assuring the highest quality in the smallest package. This creative engineering has pointed the way to substantial reductions in installation and operating costs for the industry. Research continues with the promise of even greater economies.

Utility management can thus be assured that their increasing load requirements will be met with transformers designed to meet their specific needs with maximum reliability and economy. The adjoining column provides additional facts relating to Westinghouse Form-Fit Transformers. J-97180

YOU CAN BE SURE...IF IT'S Westinghouse

More kva per pound . . . a Westinghouse achievement

Shown below is a 190,000-kva power transformer shipped upright and intact in 1953. At that time it also led the industry in maximum rating. This is additional, tangible evidence of Westinghouse skill in packing more kva into practical size and weight.

Hipersil®—vital contributor to more kva per pound

Hipersil is a grain-oriented silicon steel introduced by Westinghouse in 1935. This highly permeable material has a distinct advantage over conventional steels in loss characteristics. As a result transformer performance has been considerably improved —over-all size and weight reduced.

Next in line—315,000 kva

In process of manufacture at the Westinghouse Transformer Division, Sharon, Pa., is a 315,000-kva unit which will again be the first of its rating to be shipped intact. This new giant would not have been possible had it not been for many transformer developments which permitted the rapid increase in size of ratings, depicted on the chart below. All were Westinghouse "firsts" for the industry.

For more information on Westinghouse Transformers call your nearby Westinghouse Representative or write direct to Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

New Saguaro Station

(*Continued from page* 32)

is general with the exception of the pull-off towers which are fabricated structural steel.

The control room, enclosed working areas, and offices in the service building will be fully air conditioned. The control building is an independent structure located centrally in the plant area to serve the first two units. A temporary wall to enclose the control room will be removed with the installation of the third and fourth units. The control room is at operating deck level.

Use Miniature Instruments . . . Control panels are of the tunnel-bench type, boiler-turbogenerator combination. Instrumentation on the face of the control panels is of miniature design to reduce the size of panels. The control and instrument cables are carried generally throughout the plant on expanded metal trays. Covers are provided where trays are exposed to direct sunlight.

Complete control of all functions of the plant is to be carried on at the control panels under normal operation. From the control room, immediate access is available to the main units. Tinted-glass windows in the control room provide visual access to the plant area. Grade level of the control building has provisions for the battery room, toilet and washroom facilities, and intra-plant communication system.

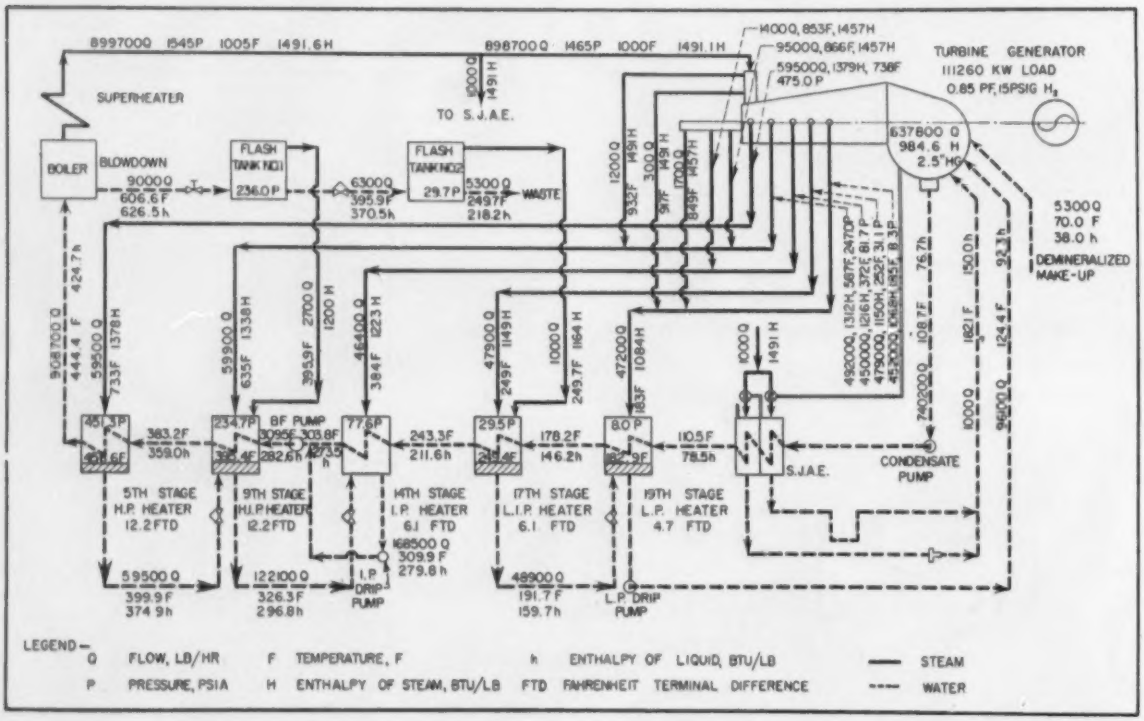
Fluorescent lighting is used throughout the enclosed building areas, with incandescent lighting used outside. All metal surfaces, except aluminum, will be light green as a basic background to harmonize with a trim of dark green. All safety surfaces, such as railings, will be an off-red orange.

Four Operators Run Plant . . . Operating force of the plant per shift will consist of four operators. A total staff of 40 is planned for the plant, including supervision, operation, routine maintenance, and yardmen. This operation force for a 200,000-kw plant is due to these factors: centralized control operation, natural gas as fuel, and establishment in 1954 of centralized maintenance for the Public Service system to eliminate duplication of maintenance crews at major plants.

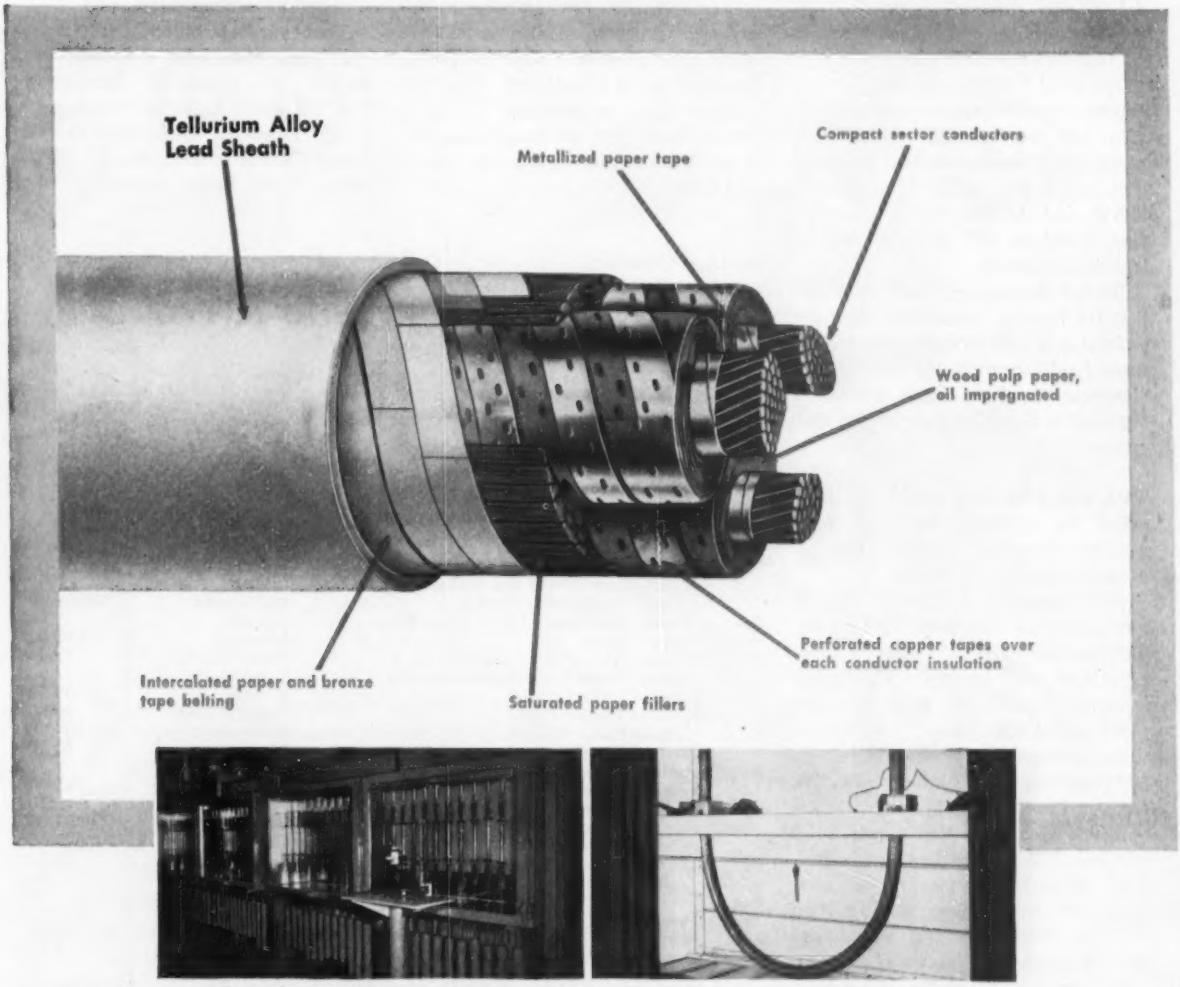
The present electrical load center of the Public Service System is located just south of Phoenix. Consideration was first given to locating a plant within the heavy load center area. However, the site at the southernmost end of the Bureau of Reclamation's Davis transmission system was dictated by two factors: unusual rapid load growth in the Public Service far-flung service area, also handicapped by capacity limitations of the Arizona portion of the Davis system.

Utilize Existing Lines . . . Saguaro Station will supply power where needed without duplicating existing facilities of the Davis system. The only new transmission facilities will be those at the various takeoff points and a 43-mile, 115-kv line to connect Saguaro to the Davis system. Two contracts detailing a three-way plan among Public Service, Arizona Power Authority, and the Bureau were signed in April, 1953 (EW, May 11, 1953, p 22). These cover the delivery of energy over the Bureau's transmission network from Saguaro Station to delivery points on the network for Public Service.

FIVE-STAGE EXTRACTION and 1,450-psig, 1,000-F steam conditions are features of the 90,000/99,000-kw, preferred standard, tandem-compound, double-flow turbines. Maximum steam flow to the turbine is 817,000 lb/hr. Heat balance is for 2.5-in. Hg back-pressure



FOR INCREASED LOAD REQUIREMENTS...PAPER INSULATED CABLE WITH TELLURIUM ALLOY LEAD SHEATH


Tellurium Alloy Lead Sheath
Metallized paper tape
Compact sector conductors
Wood pulp paper, oil impregnated
Perforated copper tapes over each conductor insulation
Intercalated paper and bronze tape belting
Saturated paper fillers

Some of the specially-developed testing equipment with which Roebling maintains quality control of the production of Tellurium Alloy Lead Sheath. #1 Temperature control ovens for creep test of strips cut from tellurium alloy lead cable sheathing. #2 Temperature control oven for bending fatigue test of full cable section.

YOU'LL REALLY solve power cable headaches with Roebling Paper Insulated Cable with the new Tellurium Alloy Lead Sheath*, a Roebling exclusive. Here are some of its outstanding advantages:

1–Tellurium Alloy Lead Sheathed Cable has a lower long-time creep rate;
2–Extra high fatigue resistance;
3–High bursting strength;
4–Exceptional stability under heat application as in duct splicing and wiping;
5–Abolishes need for frequent stop joints or reinforced lead sheath;
6–Doesn't require generous expansion bends or large manholes;
7–Heat application in splicing leaves its desirable properties unimpaired.

WRITE US FOR FULL DATA. John A. Roebling's Sons Corporation, Dept. 707, Trenton 2, N. J.

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Ike's 1955 Budget...

. . . review shows less expenditures for Interior Department, TVA, and AEC

Administration has issued its review of the fiscal 1955 budget, showing that Interior Department expenditures this year will run $16 million less than requested, Tennessee Valley Authority will spend $14 million less than it asked, and Atomic Energy Commission spending will be $225 million less than planned.

Budget Bureau approved $528 million for Interior. Administration now estimates it will spend $512 million from funds appropriated this year by Congress, or from funds previously supplied to liquidate outstanding obligations.

TVA Asked for $212 Million . . . TVA asked for authority to spend $212 million. Spending estimate for this agency is now $198 million.

AEC requested $2,425,000,000. It now appears it will spend $2.2 billion, $307 million over 1954 and the highest rate of AEC spending in history.

Other items in the budget review:

- Interior Department's new obligational authority is now estimated at $475 million, or $13 million less than requested in the original budget. TVA obligational authority will run $120 million—$22 million less than asked. AEC obligational authority will total $1,210,000,000, down $156 million from its original Budget Bureau-approved request.
- Three-fourths of the $97-million reduction from 1954 in Department of Defense and Interior spending for civil functions is being accomplished by Army Corps of Engineers and Bureau of Reclamation by not starting various "uneconomic" projects, by completing some projects, and "by carrying forward going projects at minimum economic rates."
- For all natural resources, 1955 gross budget expenditures will be reduced by about $59 million from the 1954 level. Receipts, mostly from TVA, will run about $55 million over 1954. These will bring estimated net budget expenditures in 1955 down about $114 million below 1954.
- About half the net 1955 expenditures for natural resources will be for flood control, irrigation, hydroelectric power, and other related Engineers-Reclamation projects.
- Gross TVA expenditures, at $415 million, are the largest in its history, $22 million over 1954. The increase is for construction and operation of power facilities. Higher receipts this year are expected from sale of electricity to be generated from new power facilities being completed. The $55 million more in revenue will bring TVA's fiscal 1955 net budget expenditures $33 million below the figure for 1954.

Interior Dept. Establishes 6 Regional Legal Offices

Interior Department reorganization of field legal activities is complete. Six regional offices in the office of the solicitor have been established.

To head these offices are:

J. Lane Morthland, Portland, Ore.; Leland O. Graham, Sacramento, Calif.; Richard J. Coffey, Los Angeles, Calif.; James D. Geissinger, Denver, Colo.; George B. Schwabe, Jr., Tulsa, Okla.; C. M. Soller, Juneau, Alaska.

Changes in Capacity Reported to FPC

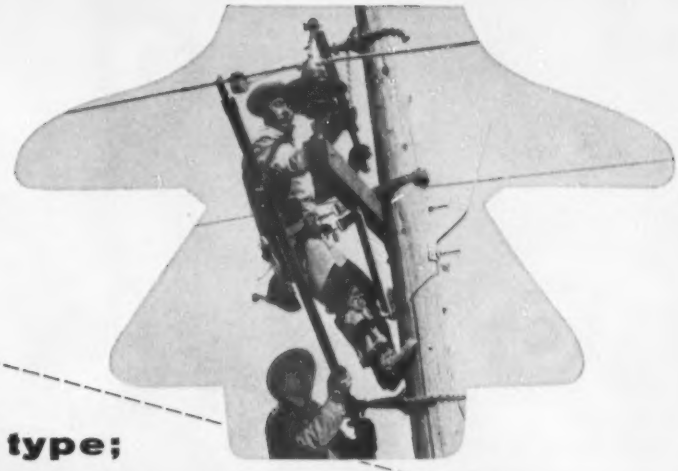
PLANT ADDITIONS DURING JULY

State	Utility	Plant	Capacity Fuel	Capacity (Kw)
Me.	Vinalhaven Light & Power	Vinalhaven	IC	250
Vt.	Burlington Electric Light Department	Burlington	S	30,000
N. Y.	Niagara Mohawk Power	South Colton	H	19,350
Pa.	Quakertown Municipal Electric Light Department	Quakertown	IC	1,100
Pa.	Pennsylvania Electric	Shawville	S	125,000
Pa.	Philadelphia Electric	Cromby	S	150,000
Pa.	West Penn Power	Springdale	S	140,625
Ill.	Northwestern Illinois Gas & Electric	Galena	IC	1,000
Ill.	Central Illinois Public Service	Hutsonville	S	60,000
Iowa	Gowrie Municipal Light & Water Plant	Gowrie	IC	750
Mo.	Union Electric	Meramec	S	110,000
Neb.	Omaha Public Power District	North Omaha	S	75,000
Kan.	Larned Electric Light Department	Larned	IC	300
Kan.	Empire District Electric	Riverton	S	40,000
Va.	Potomac Electric Power	Potomac River	S	90,000
N. C.	Carolina Power & Light	Wilmington	S	100,000
S. C.	Army Corps of Engineers	Clark Hill	H	40,000
Ky.	Paris Municipal Light & Power Department	Paris	IC	1,360
Tenn.	Tennessee Valley Authority	Kingston	S	135,000
Ala.	Tennessee Valley Authority	Widows Creek	S	112,500
Ala.	Alabama Power	Barry	S	125,000
Ark.	Arkansas Power & Light	Cecil Lynch	S	135,000
La.	Sewer & Water Board of New Orleans	Power House 2	S	20,000
Okla.	Tonkawa Light & Water Department	Tonkawa	IC	840
Tex.	Sanger Municipal Light & Water Works	Sanger	IC	500
Tex.	Texas Electric Service	Eagle Mt.	S	110,000
Tex.	Southwestern Public Service	Moore County	S	40,000
Tex.	Brownfield Municipal Light Department	Brownfield	IC	2,700
Wyo.	National Park Service	Old Faithful	IC	300
Colo.	Public Service of Colorado	Zuni	S	66,000

PLANT RETIREMENTS DURING JULY

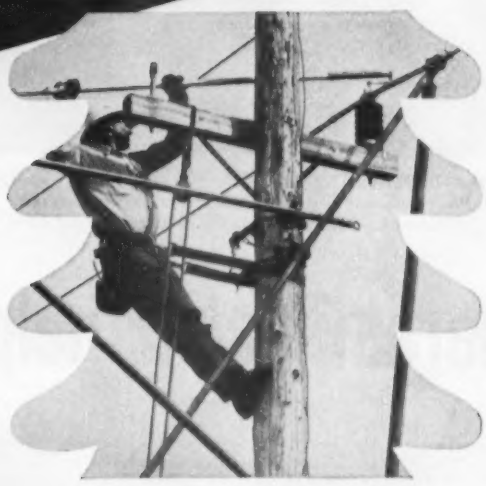
Me.	Vinalhaven Light & Power	Vinalhaven	IC	70
N. H.	Public Service of New Hampshire	Troy	H	120
Vt.	Burlington Electric Light Department	Burlington	S	1,100
Conn.	Connecticut Power	Torrington	S	1,000
N. J.	Public Service Electric & Gas	Marion	S	9,000
Pa.	Pennsylvania Power & Light	Rock Hill	H	350
Pa.	Pennsylvania Power & Light	Slackwater	H	650
Ohio	Ohio Power	Ballville	S	15,000
Ohio	Ohio Power	New Boston	S	9,500
Ohio	Ohio Power	Newark	S	8,500
Ohio	Deshler Municipal Light Plant	Deshler	IC	100
Ill.	Central Illinois Public Service	Muddy	S	20,000
Ill.	Iowa-Illinois Gas & Electric	Moline	S	6,400
Iowa	Corn Belt Power Cooperative	Klemme	IC	800
Ky.	Paris Municipal Light & Power Department	Paris	IC	357
La.	Ruston Municipal Water & Light Department	Ruston	IC	270
Tex.	Sanger Municipal Light & Water Works	Sanger	IC	100
Wyo.	National Park Service	Old Faithful	IC	60
Ore.	Pacific Power & Light	Enterprise	IC	1,000

H—Hydro, IC—Internal Combustion, S—Steam.
United States Capacity as of Aug. 1—Hydro, 22,777,586 kw; Internal Combustion, 2,231,891 kw; Steam, 71,971,028 kw; Total, 96,980,505.



You pick the right type;

WE'LL PROVIDE THE BEST



Sometimes you've probably wondered:

"Given the same (or nearly so) M&E values, will a Pintype or Post serve best on this line?"

It's a question that has been asked of us many times. Usually we can cite a number of similar, successful lines, some of which have Pintype Insulators, and some of which have Posts. Without an intimate knowledge of the proposed line and the history of its region, we can't logically express a preference.

But there is some help to be had from Ohio Brass Company. Just as choosing the right type depends on your knowledge of the line and others like it, getting the best of that type depends on the knowledge of the manufacturer you select; on his ability to produce good insulation of all types.

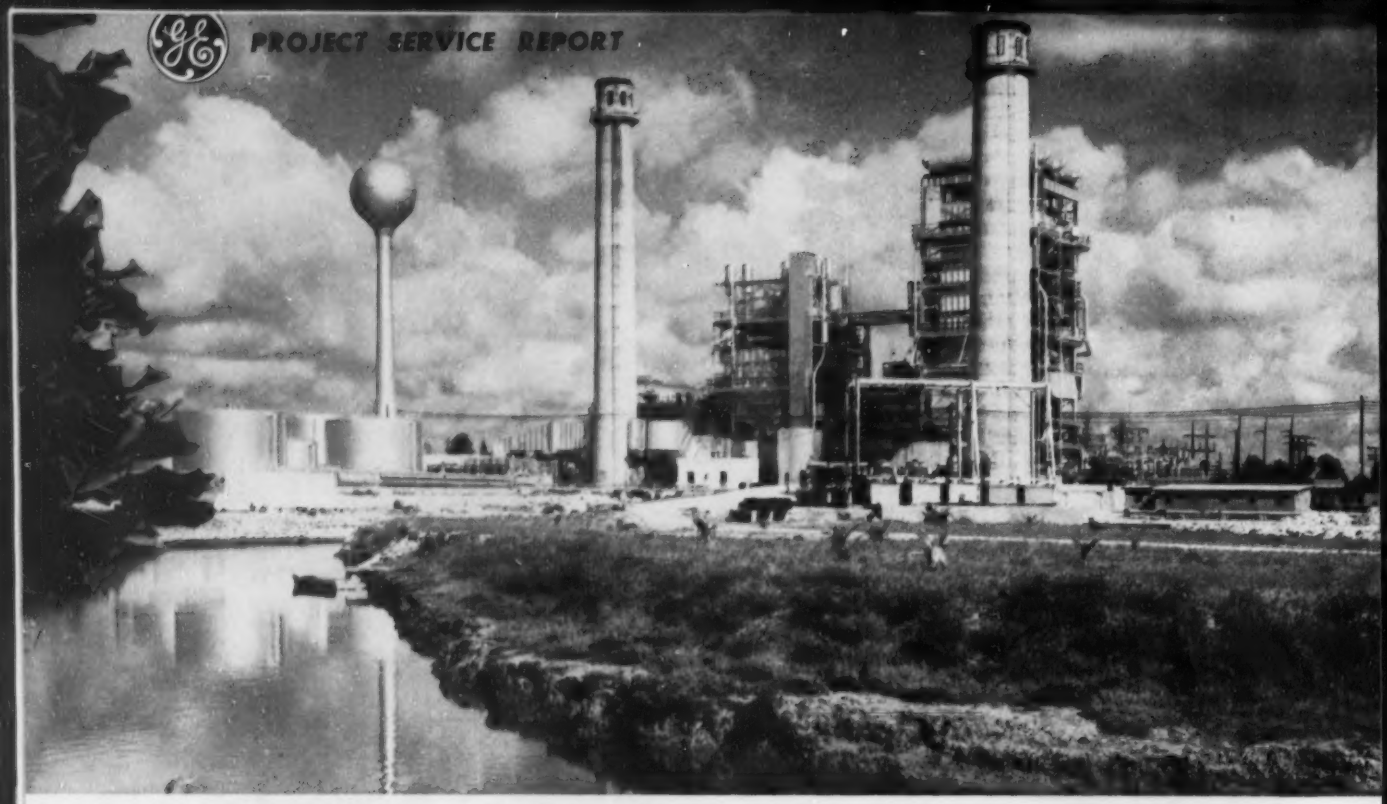
Ohio Brass makes both Pintypes and Posts; has no reason to favor one over the other. We make them equally well, and make them to the best of our ability. And so instead of choosing a "shape", you can choose the M&E characteristics needed. When you find them, you've picked the right type; we'll make the best of that type!

Ohio Brass

MANSFIELD OHIO, U.S.A.

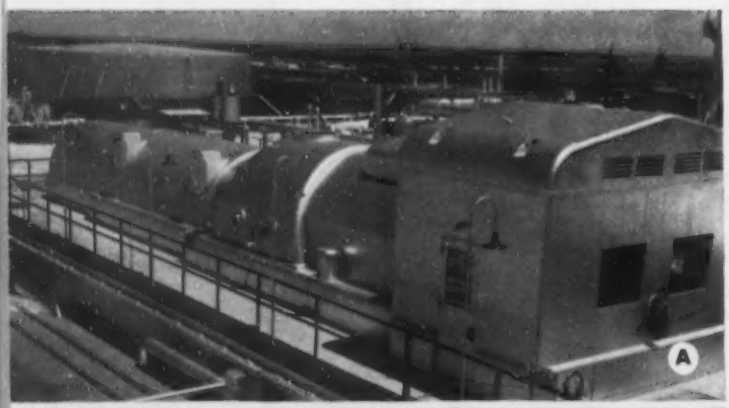
4441-H

PROJECT SERVICE REPORT



TWO G-E TURBINE-GENERATORS PRODUCE 130,000 kw at Cutler Station of Florida Power and Light Co., Miami, Fla., to handle rapidly increasing industrial and residential loads of this growing area. Throughout construction, F. P. & L. and their consultants, Ebasco Services, Inc., received consolidated project reports on manufacturing details and shipping dates of all major electrical equipment.

General Electric helps Florida P. & L. keep



A

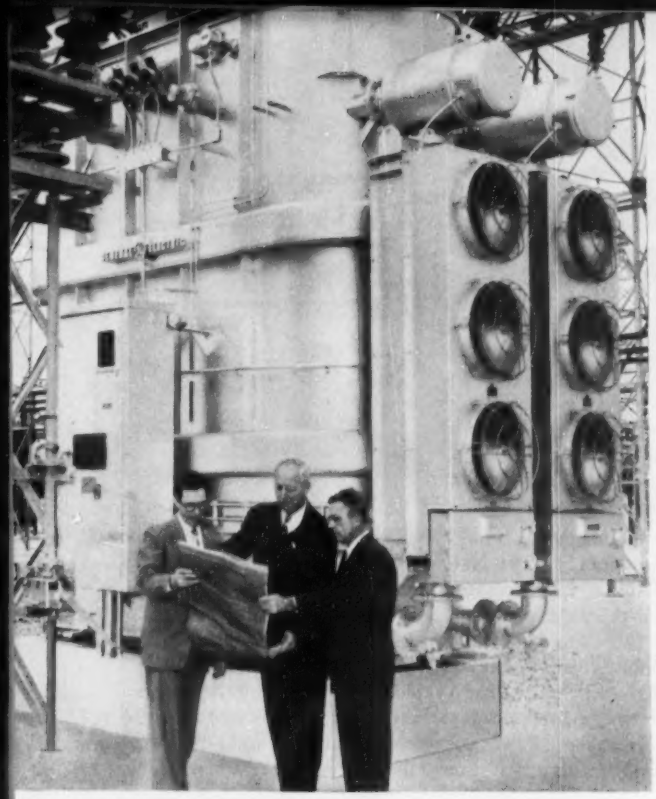
C

B

A TURBINE-GENERATOR, 80,000 kilowatts, the newest G-E unit at Cutler Station, is tandem-compound, double flow, 3600 rpm. Manufacturing time was kept to a minimum since early planning reserved factory space.

B ADDITIONAL CAPACITY is already on order for F. P. & L. to meet Florida's rapid growth. President R. H. Fite (center) of F. P. & L. discusses the installation of a new 135,000-kw G-E unit (going in service next year) with J. W. Lacy, G.E., and H. V. Street, F. P. & L's. Chief Engr.

C SYSTEM REQUIREMENTS are discussed by F. P. & L.'s H. W. Page (left), Manager Power Supply and George Kinsman, Vice President. Early planning with G-E Project Team helped F. P. & L. meet growing power requirements on time.



MAIN POWER TRANSFORMER is forced-oil air-cooled, 42,500 kva. L. H. Hill, Jr. (left), G-E Transformer Specialist, E. J. Pearch, Station Supt. and J. W. Lacy, Jr., G-E Office Manager, discuss time saved by upright shipment in one-piece tank.

EBASCO SERVICES confers in New York with G-E Sales Engineer W. Luxton. Left to right: F. A. Ritchings, Chief Mechanical Engineer, W. H. Colquhoun, Engineering Manager, Mr. Luxton, and H. L. Lowe, Chief Electrical Engineer.

OUTDOOR SWITCHGEAR connections are reviewed by E. A. Bird, Ebasco Const. Supt., W. J. Blad, G-E Service Engineer, and Mr. Pearch. Project Co-ordination greatly simplified scheduling of numerous components.

ahead of growing power requirements

Project co-ordination by G.E. on 80,000-kw addition to Florida Power and Light's Cutler Station proves planning, teamwork pay-off

Cutler Station of Florida Power and Light, located near Miami, is an outstanding example of the utility industry's bold answer to the problem of sky-rocketing load growth in many areas. General Electric worked with F. P. & L. and its consulting engineers, Ebasco Services, Inc.—co-ordinating application engineering, product specifications, manufacturing and design cycles and scheduling of electrical equipment deliveries to help make sure the station went on the line on time.

In the expansion of this outdoor station, as in many stations throughout the country, Project Co-ordination has demonstrated its contributions to the planning, engineering, and successful operation of electric utility generating plants.

Such project co-ordination, combining the utility, the consultant and G.E.'s team of sales engineer, product specialists, application engineers and field service engineers, can save you time, money and man-hours. ***Here's how:***

SIMPLIFY ORDERING OF EQUIPMENT, purchased either directly, or through your consulting engineers, or through a machinery manufacturer.

CONSERVE ENGINEERING TIME by co-ordinating mechanical details which frees you and your consulting engineers for other urgent problems.

INTEGRATE EQUIPMENT DESIGN to insure the maximum flexibility and effectiveness of plant operation.

SPEED CONSTRUCTION by scheduling the arrival of equipment for maximum installation efficiency.

SUPERVISE INSTALLATION AND HELP TRAIN OPERATORS to insure minimum start-up time and better understanding of the full operating capabilities of the equipment.

For details contact your G-E representative, or write Section 302-5, Apparatus Sales Div., General Electric Co., Schenectady 5, N. Y.

MORE POWER TO AMERICA

GENERAL ELECTRIC

Name It and

Electricity Does It on . . .

"The nation's most highly electrified farm" is the kind of operation a utility consultant dreams about

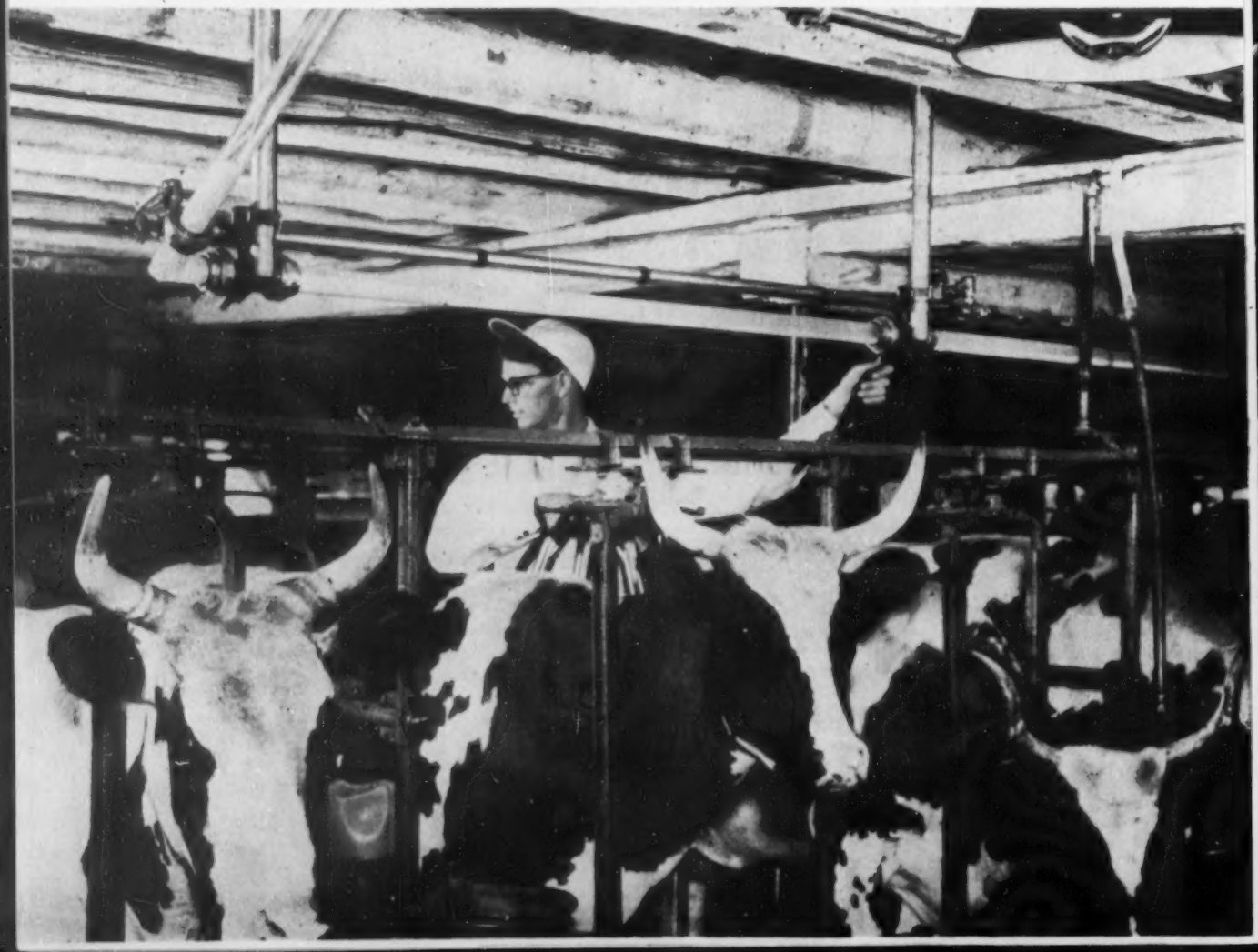
Milk 128 cows in 1½ hours . . . push a button and get a ton of feed . . . talk from the workshop with your wife in the house, without budging an inch.

That's the lot of 36-year-old John Stamy, Jr. of Cumberland County, Pennsylvania. For he is owner of what is called the most highly electrified farm in the country, the 398-acre Light's Diamond Jubilee Farm.

Stamy's farm already was better electrified than most when it was chosen by Farm Journal magazine and Pennsylvania Power & Light Co earlier this year to demonstrate, as a Jubilee observance, what electricity can do for the farm family. The National Electrical Manufacturers and National Electrical Contractors Associations pitched in, and the Jubilee farm was the result. It opened Aug. 26.

The farm is the kind of operation a utility rural consultant dreams about: 150 kw of connected load, 160 lighting outlets, more than 60 electric motors, a full dozen electric heating applications, and a 37.5-kva transformer to service them. Power consumption runs five times that of an average farm; ten times that of average urban home.

Electricity milks cows, pumps milk through glass tubes to electrically refrigerated bulk tank. Three men can milk 128 cows in 1½ hr



With electrical help, Farmer Stamy's herd now can produce 1 million lb of milk a year—half again as much as before. Milk is automatically pumped from milking machines through glass pipelines into a 1,000-gal refrigerated holding tank. Milklines are sterilized by an electric pump which swishes an electrically heated detergent and water solution through them while electric barn cleaners tidy up the gutters. Barn is electrically ventilated, and electric room heaters keep things warm on cold days. Even flies are kept away with an electrically operated fly sprayer. In the mow, a 7½-hp fan drys and cures the bales of hay.

An electric feed grinding and mixing system takes care of all the animals' feed needs. It includes automatic conveyors, auger elevators, a hammer mill with automatic drag feed, a grain crimper, and a batch mixer. Installation uses nine electric motors, the largest a 7½-hp unit on the feed mixer. Stamy knows his electric bill will be higher, but he says, "It won't be anything like the saving I'll make on low cost feed." He had been paying out more than $1,500 a month just for concentrate feed for his dairy herd.

The farmshop, also electrically heated, has a full line of electric equipment—everything from a drill press to a hoist and a welder. The brooder house has infrared brooders.

Early American furnishings are about the only things traditional that remain in the Stamy's 120-year-old stone farmhouse. An all-electric kitchen, an automatic laundry, two window air conditioners, wall box dimmers in the dining room and a hair dryer only start the list of electrical applications. There is even a portable intercommunication system between the house and farm buildings.

Of the farm's total load, the barn and milk house represent the largest part—about 55 kw. The house accounts for 45 kw, the feed mill 27 and farm shop, 14. Lighting requires 37.55 kw to make it the largest single application.

Wiring to handle this tremendous farm load is everything the Adequate Wiring Bureau could ask. Five miles of wire and one mile of conduit are used. Every building has extra unused circuits. Motors are enclosed and light fixtures are dustproof wherever needed. Circuits are fed from two circuit breaker panels, one for farm units, one for house.

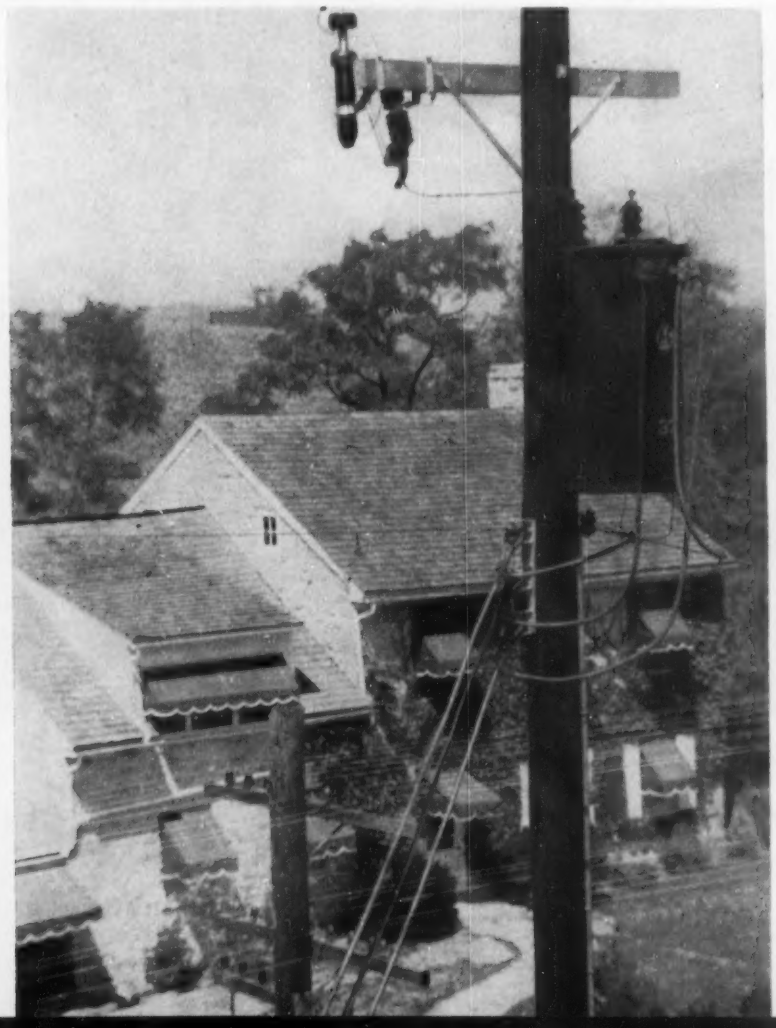
At the public showing of the farm last month Charles Oakes, PP&L president, said: "The electric utility looks at agriculture as an industry to which should be applied the same efficient mass production methods used so successfully by other industry."

R. W. Beard, Allis-Chalmers Manufacturing Co and chairman of NEMA's Farm Electrification Committee, recalled the days when a 1.5-kva transformer was deemed too large for farm use. "This was shortsighted," he said. "Very soon a 3 kva and then a 5 kva came into use, and now we see a 37.5-kva transformer being used here today."

Widespread as its electrical uses are, the farm's entire installation is engineered for the usual single phase service.

"Thus," contends Farm Journal and PP&L, "what has been done on the Stamy farm can be done on almost any rural line in America."

Farm's electric load is served by 37.5 kva transformer. The Stamy home is in background



Equipment That Runs The Jubilee Farm

Here is a list of the electric equipment used by Farmer Stamy (his home excluded) on the "nation's most highly electrified farm":

EQUIPMENT	KW CONNECTED
Farm Shop	
Radial saw	1.5
Portable saw	0.25
Drill press	0.5
Table grinder	0.5
Floor grinder	0.5
Hoist	1.0
Lathe	0.5
Air compressor	0.75
Welder	5.0
Feed Mill	
Feed mixer	5.0
Hammer mill	7.50
Crib drag	0.50
Grain crimper	3.0
Elevator	1.50
Three bazooka elevators (total)	8.0
Metering conveyor	0.5
Barn and Dairy	
Infrared stock brooders	2.5
Infrared poultry brooders	2.00
Stock water tank & heater	1.20
Silo unloader	3.00
Pipe line milker	1.00
Gutter cleaners (total of 4)	12.00
Ventilation fans (total of 2)	1.50
Electric fly sprayer	.30
Refrigeration compressor	7.50
Water heater	4.0
Hay drying fan	7.50
Elevator	1.50
Unloading wagon	.50
Lighting	
Interior (total)	17.00
Exterior (total)	1.1
Space Heating (total of 3)	4.40

Allis-Chalmers Manufacturing Co. photo

Is Poor Voltage *Cutting*

HERE'S HOW poor voltage cuts into system revenue: if voltage is only 2.5% low on a 1000-kva yearly peak load, revenue drops as much as $600 per year. Ten percent low voltage costs as much as $4500 in revenue. And it's all a direct loss in profits. Return on system investment is far below what you can get with proper voltages. The chart at right tells the complete story for a typical system.

How can you turn this lost revenue into profits? An easy-to-install answer is an Allis-Chalmers distribution regulator. It will not only keep voltage up, it will pay its own way — out of increased revenue — in as little as two years. After that, all increases in revenue are pure profit to your system.

Allis-Chalmers distribution regulators are a particularly wise choice. Twenty years' experience with their rugged, reliable design has proved it. Hundreds of distribution men will tell you from their own experience of their accuracy and reliability.

Field-proved design, rugged construction, and simplified installation and maintenance add up to a regulator that can turn lost revenue into real profits. Get all the facts on Allis-Chalmers distribution regulators. Call your nearby A-C office or write Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-

Your System *Revenue?*

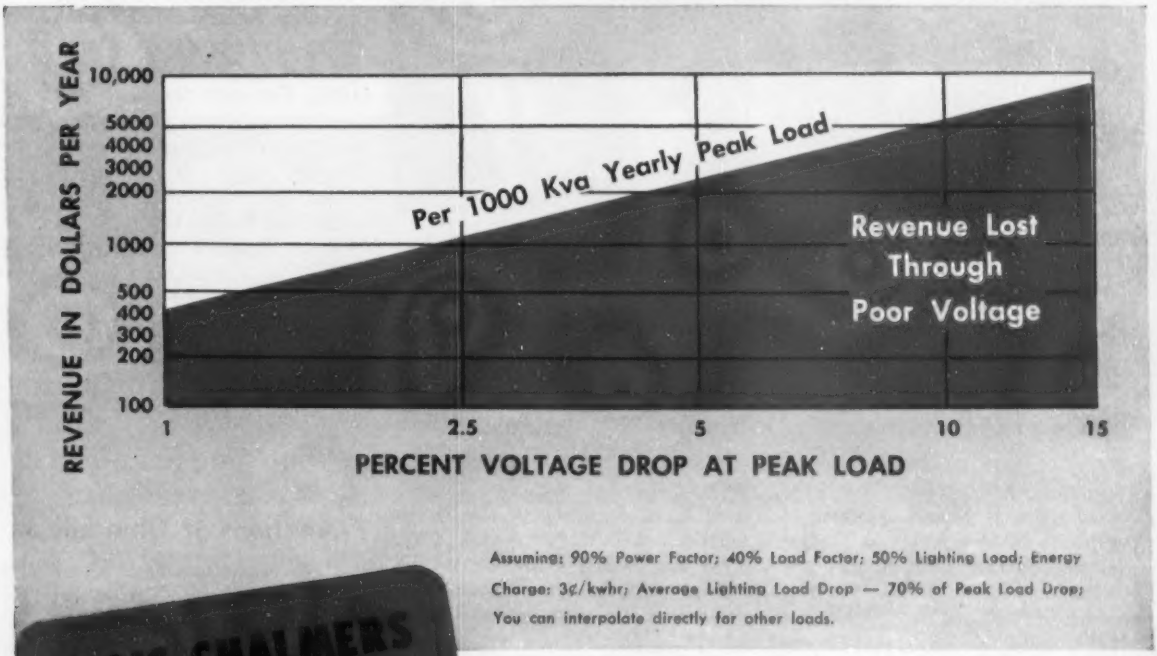


Chart shows revenue losses when voltage is poor on a typical distribution line.

ALLIS-CHALMERS 5/8% STEP VOLTAGE REGULATORS

Field-Proved Mechanism

You get a time-tested mechanism in Allis-Chalmers distribution regulators. For twenty years in thousands of applications this mechanism design has proved itself as the most efficient means of changing taps under load. Laboratory tests show it can withstand over five million operations.

Long-Life Contacts

An important reason why you get satisfactory regulation with a minimum of trouble from A-C distribution regulators is their long-life contacts. Made of arc-resisting materials, contacts are of large size. Laboratory tests prove that they can stand up under the equivalent of forty years of normal operation.

Unit Construction

You get assurance of years of satisfactory service from A-C distribution regulators because of unit construction. All connections are made and thoroughly inspected before tanking — assuring top-quality workmanship. Same feature makes untanking and inspection easy because core, coils, cover, and control form a single unit.

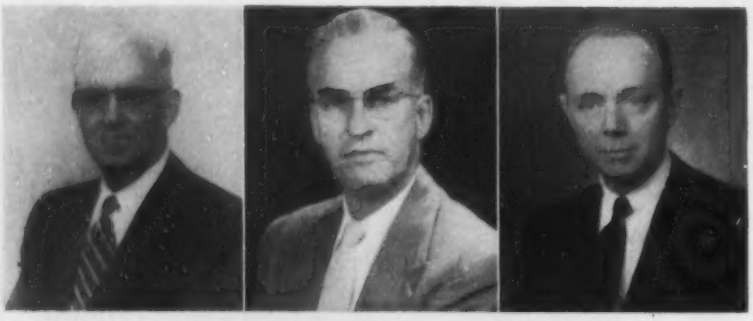
Simplified Maintenance

You don't need highly trained servicemen to handle Allis-Chalmers distribution regulators. Take the control, for example. It is simple. Knobs are calibrated and easy to adjust. If needed, you can remove and replace the entire control merely by pulling a single jack plug — there are no other connections to break.

A-4415

CHALMERS

NEWS ABOUT PEOPLE



DUDLEY SANFORD GEORGE P. GAMBLE G. V. WILLIAMSON

Moody Becomes Chairman . . .

. . . at Union Electric Co of Missouri. Dudley Sanford is elected executive vice president and G. P. Gamble, G. V. Williamson vp's

Union Electric Co of Missouri has elected Ralph E. Moody chairman of the board of directors and Dudley Sanford executive vice president, it was announced by J. W. McAfee, president.

McAfee also announced that George P. Gamble has been made vice president in charge of operations and G. V. Williamson has become vice president in charge of power production and distribution.

All the changes will become effective on October 1.

Joined Union in 1941 . . . Moody became associated with Union Electric in 1941 after more than a quarter-century of experience in the electric industry as an operating executive of utility companies in Wisconsin and assistant to president of the North American Co in New York City.

He was elected a director of the Union Electric in early 1941 and vice president in charge of operations later that year. In 1947, he was elected executive vice president, and since 1952 he has served as executive vice president and general manager.

Moody will, along with general executive duties, direct establishment of a system for handling various relations with common stockholders and take responsibility for a review of our corporate organization in light of today's needs, McAfee said.

RALPH E. MOODY

Was a Former Treasurer . . . Sanford joined Union Electric as an industrial engineer 35 years ago. He served as treasurer of the St. Louis County Gas Co (formerly a part of the Union Electric system), as assistant treasurer of Union Electric, and as the company's executive assistant on matters relating to the operation of the electric system and its coal mining and railway subsidiaries.

In 1948, Sanford was elected vice president in charge of operations of Union Electric. He became a director of the company in 1950 and two years later was elected vice president and assistant manager. He held this post until his election as executive vice president.

Became Resident Electrical Engineer . . . Gamble was the resident electrical engineer for Stone & Webster Engineering Corp on the construction of Union Electric's Bagnell Dam. Shortly thereafter, in 1932, he was employed by Union Electric. He became superintendent of power production in 1943 and was elected a vice president in 1950. For more than two years, he has been in charge of power production and distribution, and of steam heating.

A 32-Year Employee . . . Williamson, who succeeds Gamble as vice president in charge of power production and distribution and of steam heating, has been with Union Electric for 32 years. He served as assistant to the chief engineer of power plants, superintendent of steam engineering, and in 1952 he was made superintendent of power production.

Promotions at Ohio Edison

Three promotions have been made by the Ohio Edison Co. Robert F. Hartenstein, in charge of electric and steam heating sales for the Akron Division, takes over commercial and farm electric sales starting Oct. 1. Charles B. Olds, a manager of the rate evaluation department in Akron and until recently in the Alliance Division, succeeds to Hartenstein's old post. Robert W. Butts, general supervisor of commercial sales, has been named general supervisor of dealer coordination.

•

O. E. Osgood, assistant superintendent of Puget Sound Power & Light Co's White River power plant, has retired after 44 years of continuous service with company.

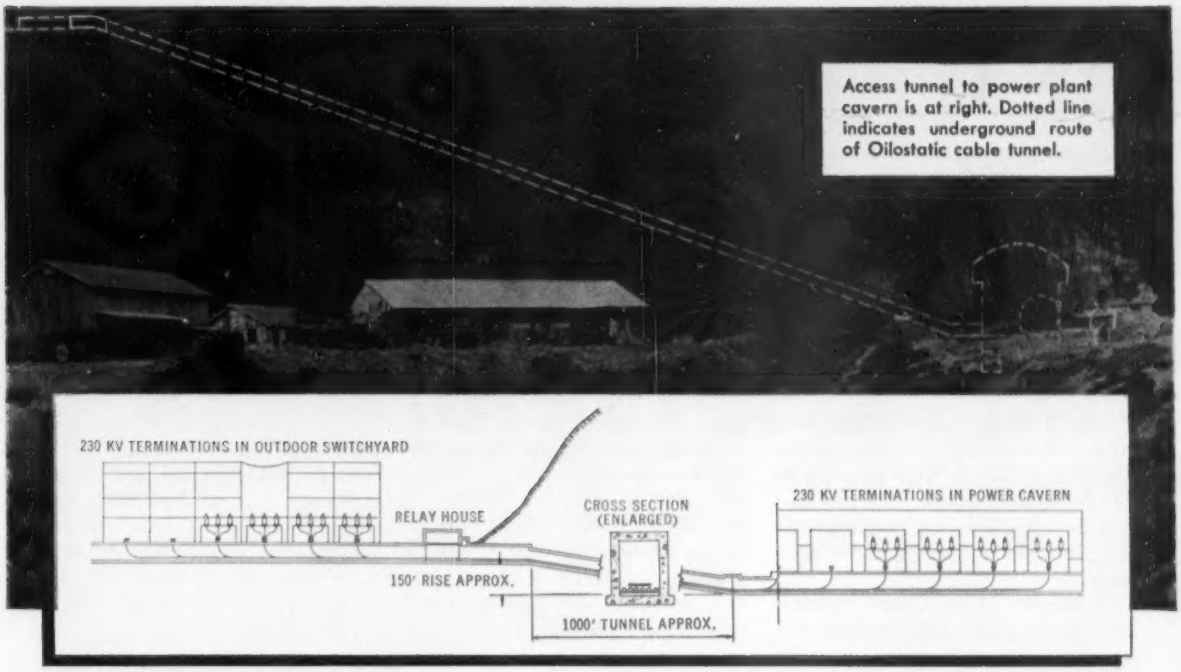
John P. Thompson has been appointed by Governor Dan Thorton to the Colorado Public Utilities Commission. Thompson succeeds John H. Winchell, appointed by President Eisenhower to the Interstate Commerce Commission.

Christopher T. Kastner and J. Benning Monk have been appointed as new sales managers in the General Electric Co's Power Transformer Department.

Andrew Liston has been made general sales manager of the Eddystone Division of Baldwin-Lima-Hamilton Corp.

ANOTHER OKONITE FIRST:

the first American-built 230 kv Oilostatic high-pressure oil, pipe-type cable system


Access tunnel to power plant cavern is at right. Dotted line indicates underground route of Oilostatic cable tunnel.
230 KV TERMINATIONS IN OUTDOOR SWITCHYARD
RELAY HOUSE
CROSS SECTION (ENLARGED)
230 KV TERMINATIONS IN POWER CAVERN
150' RISE APPROX.
1000' TUNNEL APPROX.

Schematic Cross-Section of 230 kv Oilostatic Cable System
Cubatao Underground Station, Sao Paulo, Brazil.

Okonite's leadership in the development of high-tension cables is again demonstrated by the manufacture of a 230 kv Oilostatic cable—the first American-built 230 kv high-pressure, pipe-type cable system. This cable, recently shipped, was ordered in March, 1951, for installation at the Cubatao Underground Power Plant of the Sao Paulo Light and Power Company Limited, Sao Paulo, Brazil.

The underground power plant, utilizing a hydrostatic head of 2,300 feet, is located in a cavern 600 feet inside a mountain. Four Oilostatic circuits of single conductor, 500 MCM, 0.835-inch paper-insulated, shielded, D-shaped copper wire armored cables will carry the output of the four 65,000 kw generators being installed. A separate tunnel from the power plant to the switchyard is provided for the cable circuits and the control cables.

Oilostatic high-pressure oil, pipe-type systems are self-supervising, easy to install and require negligible maintenance. For complete installation and operation information, write to The Okonite Company, Passaic, N. J.

OKONITE OKONITE SINCE 1878 ***insulated cables***

2591

H. W. TICE

JAMES F. DAVENPORT

Tice Appointed Senior VP . . .

. . . of Southern California Edison. Company also makes James F. Davenport vice president and general manager

Top level appointments have been made by Southern California Edison Co. They include the election of H. W. Tice as senior vice president and James F. Davenport as vice president and general manager of the company.

A member of the Edison organization for 32 years, Tice formerly was vice president and general manager. Davenport, who became associated with the utility in the middle twenties, formerly was vice president and assistant general manager.

Began as an Electrician . . . Tice joined Edison in 1922 as an electrician at Visalia. The next year he was appointed general foreman at the company's Los Angeles office, becoming operation engineer in 1927. He was advanced to assistant manager of operation in 1937 and manager of operation in 1941. Four years later he was elected a vice president and in 1953 was named vice president and general manager.

Davenport started with Edison's engineering department in 1926, and three years later was made hydroelectric engineer. He was appointed superintendent of hydroelectric generation in 1931, superintendent of generation in 1937, and assistant manager of operation in 1940.

Depa Administrator . . . After a four-year period of service with the Air Force, Davenport returned to Edison as an assistant vice president in 1946. He was elected a vice president in 1951, and in 1953 served in Washington for six months as administrator of the Defense Electric Power Administration. Last year he was elected vice president and assistant general manager of Edison.

Pacific G&E Makes Personnel Changes

Pacific Gas & Electric Co has appointed Roy N. Dreiman assistant comptroller, R. W. Joyce manager of the commercial department, and Richard L. Hayden manager of the new customer and community services department.

Dreiman was vice president and treasurer of both Pacific Public Service Co and Coast Counties Gas & Electric from 1948 until the companies were merged with PG&E.

Joyce, previously assistant commercial manager, succeeded James F. Pollard who retired on August 31. He was employed by Puget Sound Power & Light Co from 1928 to 1947.

Hayden joined Coast Counties G&E in 1930. Starting as sales supervisor at Vacaville, he rose through various positions to sales manager, then to director and vice president before joining Pacific G&E.

Steele Elected President

Benjamin Electric Manufacturing Co has elected Hoyt P. Steele president, succeeding Walter D. Steele, a co-founder of the company in 1901, who resigned. Walter Steele has been president of the company since 1928.

Atomic Managers Named

Westinghouse Electric Corp's atomic power division has appointed John W. Simpson and John T. Stiefel new project managers. Simpson becomes manager of the PWR (pressurized water reactor) project which is the reactor for the nation's first atomic powered electric generating station to be built at Shippingport, Pa. Stiefel becomes manager of the STF (submarine thermal reactor) projects which includes the building of the atomic engine for the atomic submarine U. S. S. Nautilus.

•

L. O. Bradshaw has been appointed director of Mississippi Power & Light Co's newly created development department. Bradshaw was originally employed by the company in 1945 as an agricultural engineer in Cleveland.

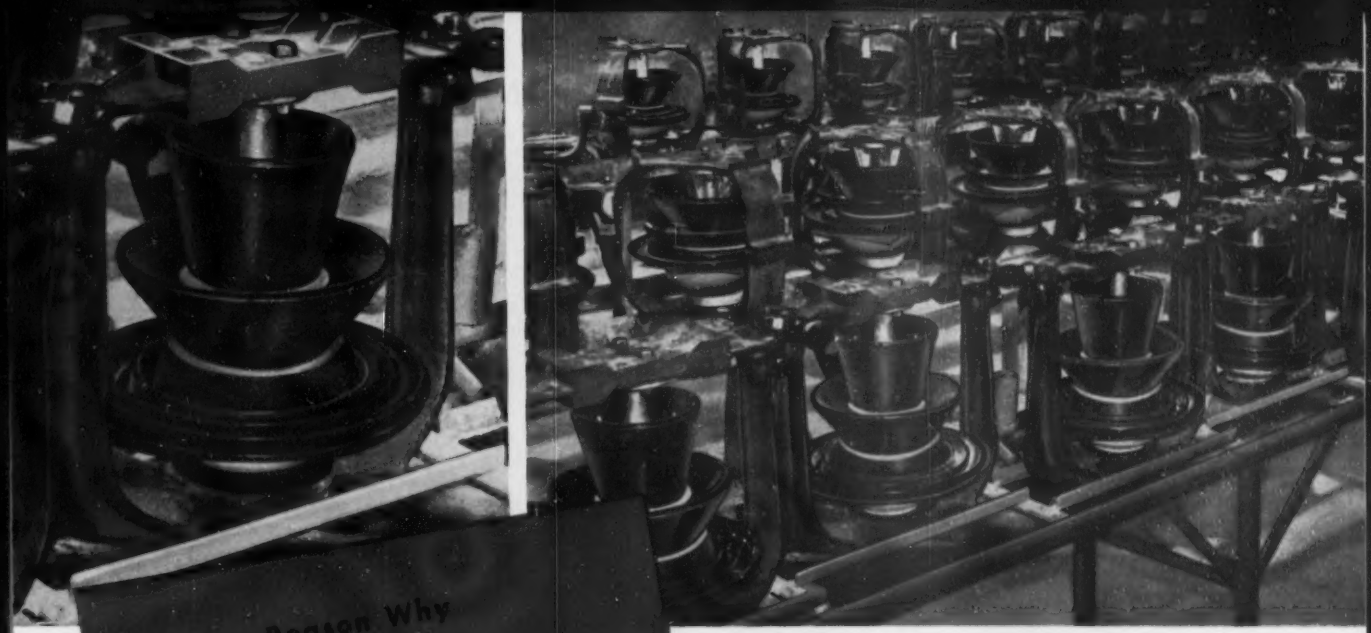
Ralph W. Ingalls Jr has been appointed chief engineer of the Public Service Co of Oklahoma southwestern power station at Washita.

Dave Shore, superintendent of Pacific Power & Light Co's Merwin hydro plant, has retired after some 60 years in the electric industry. He started working at the age of 15 in the shops for the Minneapolis General Electric Co.

Ray Edward Untereiner has been named a member of the California Public Utilities Commission, succeeding R. E. Mittelstaedt, retired.

OBITUARY

James C. Knowles, 66, retired vice president of Pennsylvania Power & Light Co died Sept. 12. He joined PP&L as superintendent of its Williamsport Division in 1924. He retired on Dec. 31, 1953.



Left: Victor uses seasoned cast-iron jigs for greatest accuracy.
Above: Victor Apparatus Insulators assembled in precision-aligned jigs.

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VICTOR Makes Better Insulators

WE USE ACCURATE JIG ASSEMBLY METHODS

APPARATUS INSULATORS require accurate assembly of porcelain and metal parts to achieve perfect alignment and accuracy of installation on the job.

One of many reasons why Victor apparatus insulators have such enviable service records is Victor's use of precision-built cast-iron jigs. Here, every insulator is clamped in position to assure accurate alignment. Before shipping, each unit is thoroughly tested mechanically and electrically in accordance with NEMA specifications.

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Series 44-104 for single or dual rear wheel chassis having 60″ C.A. dimension.

Series 44-L-90 for chassis having approximately 48″ C.A. dimension.

Series 44-L-104 for 60″ C.A. chassis having single or dual rear wheels.

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SERIES 44 and 44-L

SERVICE AND MAINTENANCE BODIES

These five bodies have an impressive record for saving time and money on service jobs. Compartments are equipped to keep tools and supplies safe and orderly — easy to inventory before leaving for the job — easy to find upon arrival. The bodies are adaptable to a wide variety of service operations, and each model can be transferred to a new chassis when the original truck wears out. If you're looking for new ways to get more productive man hours, you'll want full information on Series 44 and 44-L bodies. Why not send for complete details . . . now?

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Please send me complete information on the following:

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Solving Cooling Water Problem

Springfield municipal plant installs new pumps, modifies old ones to cope with lower lake level caused by drought

Dry weather in central and southern Illinois drastically curtailed the cooling water supply for the Springfield municipal power plant. Although service to the city's customers was not curtailed, some drastic measures were required.

Cooling water for the 80,000-kw plant, firm capacity 60,000 kw, is taken from Lake Springfield, an artificial lake which was built in 1935. Normal elevation of the lake is 560 ft above sea level. It was lowered 10.4 ft to 549.6 ft elevation as a result of reduced rainfall in 1953 and so far this year. Average rainfall is 36 in. In 1953 the rainfall was 23.9 in. and so far this year there have been only approximately 15.28 in. of rain in the watershed.

This reduction in lake level reduced the amount of water in the lake from a normal 21.4 billion gal to 10.5 billion gal. At the same time water temperature increased and duty on the intake pumps was increased.

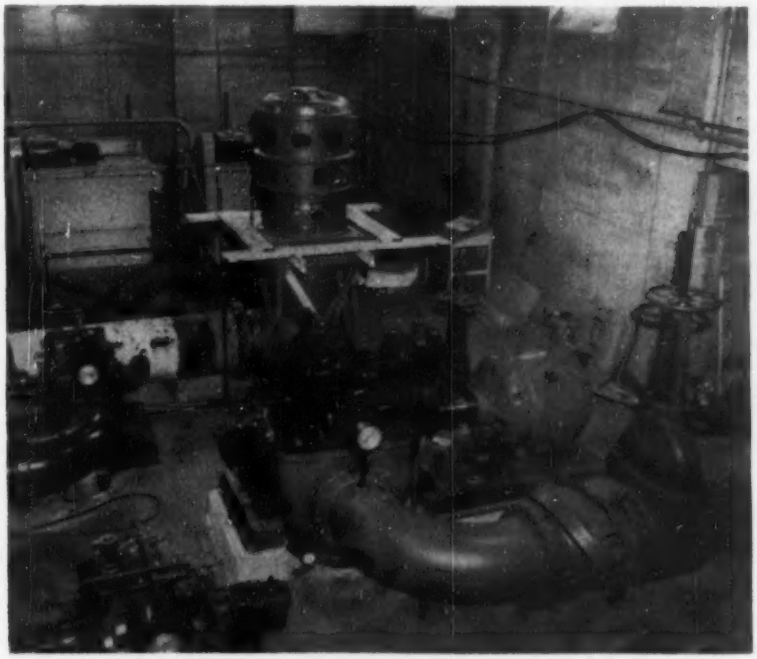
The Remedy . . . The intake tower is located east of the power plant, about 50 yd from the shore line. Upon recommendations of Burns & McDonnell, Kansas City, Mo., consulting engineers:

1. Water intake pumps were modified so that they can operate efficiently with the lake level down to 547 ft elevation.

2. Two additional pumps have been purchased and are being installed. One of the new pumps will have a capacity of 50,000 gpm and the other will have a capacity of 25,000 gpm. Estimated cost of this installation is reported to be $150,000.

If the drought shows evidence of continuing the consulting engineers have recommended that a channel dam be installed across the south fork of the Sangammon River below its junction with Horse Creek, which is approximately one-half mile east of the lake's dividing dam. Water would be pumped from this channel to the dividing dam and into the lake. The dam would be designed to pass flood water without damage and to cause no back-water effect when the stream is at bank-full stage.

Estimated cost of the new pumps, modifying the old pumps, and building the dam and facilities to provide additional water in the lake is approximately $500,000. The channel dam would have to be ready by March 1, 1955.



TWO NEW PUMPS, of 50,000 and 25,000 gpm capacity, have been installed at Springfield plant

3rd Coulee Powerhouse Is Held Impracticable

Although a third powerhouse could be built at Grand Coulee Dam, an engineer who studied the proposal for two years believes the powerhouse would not be feasible. It would cost too much and there might not be enough water to run it.

Charles S. Hazen, area engineer in Spokane for the Bureau of Reclamation, said that the present 18 generators at Grand Coulee Dam "will use all the water that will be available on a year-round basis for a long time to come."

Hazen has had charge of an investigation begun in 1952 for possible sites for an additional 12-generator powerhouse at the dam on the Columbia River. He said plans for another powerhouse on the west side were dropped due to high tunnel costs.

The plan finally recommended, according to Hazen, calls for another powerhouse at the east end of the dam. It would have a tailrace upstream from Caisson dock, and water would be brought from upstream in the river via one, two, or three tunnels.

The first powerhouse unit would consist of four generators like those in the present powerhouses, with provisions for adding two banks of four generators each later. Hazen estimated the cost of the third powerhouse with four units installed at $75 million.

The inquiry, undertaken as a result of Congressional interest, shows that an added 10 million acre ft of upstream storage would provide enough water to keep the present 18 generators running at capacity.

AIEE Membership Up

American Institute of Electrical Engineers reports that its membership has reached 48,515, an all-time high for the association. In addition, the institute has 3,371 student members.

AGA-EEI Training Kit Available

A customer relations training package has just been completed by the American Gas Association and the Edison Electric Institute.

The material is packaged in a durable and portable case. Included is a manual of customer relations principles that will serve as a valuable guide for supervisors who have the responsibility for training employees in various types of customer contact jobs.

It is divided into five sections, one for each of the four major groupings of customer contacts, together with one section on analysis of the basic principles.

Each section also contains detailed instruments for conducting meetings on the subject discussed in the section. The manual also contains a bibliography of reference material. Printed in two colors with illustrations, the manual is notebook size and attractively bound.

The five sound slide-films included in the course run about 22 minutes and take up two sides of a 16-in. record. The sound recordings for the films are based on excellent script with a large range of voices and musical effects, pertinent to the message. Each slide-film also has a silent trailer suggesting questions in visual form to stimulate discussion after seeing the films.

Produced at a cost of well over $100,000, the package is now available for only $295 per set. The cost is graduated downward for companies ordering more than one set.

Purchase order forms are available at headquarters of either the American Gas Association or the Edison Electric Institute, 420 Lexington Ave., New York 17, New York.

Is U. S. Losing Engineer Race?

America is rapidly falling behind Russia in the race to produce engineers, M. H. Trytten, director of Office of Scientific Personnel of National Research Council, warned members attending the fall meeting of the American Society of Mechanical Engineers in Milwaukee recently.

"It seems probable," Dr Trytten said, "that the total number of trained engineers in Russia today is closely comparable to the number in the United States." To accomplish this, Russians have increased the number of engineering graduates from 29,000 in 1948 to more than 50,000 in 1954. In contrast, United States graduated only 19,000 engineers in 1954.

Russia's Education Up . . . Drawing on information obtained from Soviet sources and statistics covering the past 30 years, Dr Trytten stated that the number of higher educational institutions in Russia increased from about 750 in 1939 to about 900 in 1952. Enrollment in these institutions grew to 916,000, a 50% increase over the same period.

Even more significant, he said, is the fact that enrollment for professional training has grown sixfold in the past 25 years, while training of supporting semiprofessional personnel has grown sevenfold.

"Engineering training," Dr Trytten pointed out, "lasts five to five and half years and is based on about 5,000 hours of lectures, classroom and laboratory instruction, attendance at which is mandatory."

Soviet Training Begins Early . . . Soviet professional training begins early in the secondary schools where "emphasis is strongly on science and mathematics for all students. There are no electives and about 40% of the curriculum is devoted during the three years to science and mathematics."

He reminded his audience that perhaps only 20% of our high-school graduates have had general science courses and only 6-8% have had physics and chemistry.

One of the major differences between the American and Russian educational systems, he pointed out, rests in the area of training below the professional levels.

Trytten said that the Russians have some 3,500 technikums, or technical institutes, offering three and four curricula. These schools have over one million students and are now turning out 350,000 graduates annually, of which 50,000 are engineering technicians.

Local control of education, which may have been our greatest strength in the past, he warned, may become a source of weakness in the future "unless greater awareness of the importance of education is developed." He advised improving the teaching of science in high school.

NPPA Survey of Wages Highlights Fringes

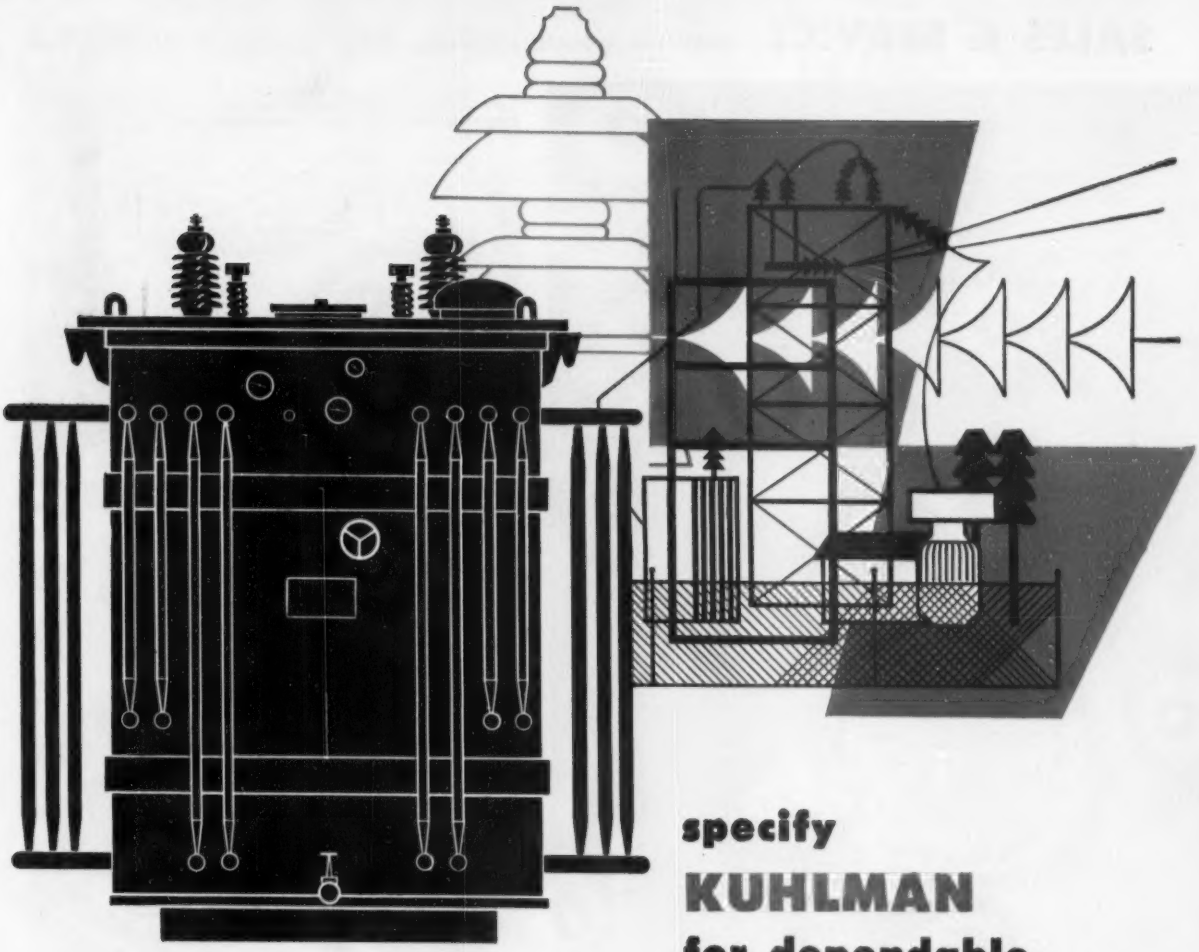
Fringe benefits are spotlighted in the eighth annual survey of wages and working conditions by the Northwest Public Power Association. This study of utility wage trends covers 24 Public Utility Districts, 18 municipals, 53 rural electric cooperatives and five private companies in Alaska, Montana, Idaho, Oregon and Washington. The job of journeyman lineman is used as the basis for comparison.

Western Washington electric systems continue to set the pace for wage levels with $2.50 per hour in 1952, $2.65 in 1953 and $2.70 in 1954. Rural co-ops pay less than these rates but their wage trend is rising faster. Oregon and Washington cooperatives increased wages 30¢ in two years, to $2.60, compared with a 20¢ increase in Western Washington.

Fringes appear to be holding steady at 20% added cost as computed upon the actual work year. In this survey, fringes are figured on a base of hours actually worked rather than on annual wages. There is a tendency for fringes to be increased for systems with lower total labor cost.

The survey reports on manager salaries, number of electric consumers, date of union agreement, and average age of male employees. Vacation and holiday practices, ratio of groundman to journeyman lineman pay, and the actual labor cost for journeyman lineman per hour actually worked is also covered.

Copies of the last three surveys are available from the NPPA, 1311 Columbia St, Vancouver, Washington.



specify KUHLMAN for dependable power transformers

For more than half a century, Kuhlman Power Transformers have been providing a steady and dependable source of power for American utilities and industry. Built from finest quality materials and engineered for safe, economical operation, these units incorporate the latest design principles, many of which were developed by Kuhlman. Coils are dried under heat in vacuum to insure uniformly high insulation strength and then impregnated with thermosetting varnish to provide good mechanical strength. Insulation is coordinated to the basic impulse level. Windings are equipped with wide oil ducts for insulation and ample cooling. Oil is introduced under vacuum to prevent entrapment of air and insure high insulation strength. Construction throughout is sturdy and rigid. Structural steel core clamps hold the core securely in place to prevent shifting or vibration and provide support for coil braces, lead guides and terminal structures. Tanks are constructed of heavy steel plate, and sealed to minimize deterioration of oil.

Kuhlman Power Transformers are assembled by men who are highly skilled in the electrical crafts. They are thoroughly inspected and tested to meet rigid quality standards. Kuhlman Power Transformers can be produced in a wide variety of ratings, with accessories to suit the specific needs of utilities and industries. For complete information, write for Bulletin CS-601. Kuhlman also builds Distribution, Dry Type, Saf-T-Kuhl, Subway, CSP and Series Street Lighting Transformers. Bulletins are available on these models as well.

151-T

KUHLMAN

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • Southern Division, CRYSTAL SPRINGS, MISSISSIPPI

EXPORT REPRESENTATIVE: INTERNATIONAL STANDARD ELECTRIC CORP., 15TH FLOOR, 50 CHURCH STREET, N. Y. 7, N. Y. CABLE ADDRESS: MICROPHONE, N. Y.

SIXTY YEARS OF PROGRESS IN THE ELECTRICAL INDUSTRY

BY FLIPPING SWITCHES home-owner learns why adequate wiring is necessary. "Overload" rings when appliances are too much for circuit to handle

BEFORE: Display's illuminated cartoons show effects of inadequate wiring. Kitchen is in turmoil when circuits are overloaded

AFTER: With plenty of outlets, mother serves breakfast with ease, everyone gets to work and to school in plenty of time

Audience Participation Sells AW

What's the score in your house?

With this question, Metropolitan Edison Co is forcibly illustrating the benefits of adequate wiring by means of an audience participation-type display now appearing at builders' shows and fairs in its service area.

Already the display has attracted more than 75,000 spectators. It recently was a feature of the openhouse at MECO's new operating headquarters building (EW, Aug. 2, 1954, p 16) and the company also plans to take it on a tour of its district offices.

Question is centered on the display board. People who want to "know the score" are given an opportunity to operate a toaster, coffee maker, griddle, mixer, iron and refrigerator motor which are prominently displayed next to individual switches. As each switch is turned the wattage required to power the appliance registers on a meter. Operator has the choice of running the device on either a 15 or 20 amp circuit breaker. When overloading takes place the breaker trips, ringing a bell and lighting up a sign which reads "overload."

This combination of audience participation, action and noise serves as an ideal attention getter. At the same time it highlights the need for more than one circuit to operate commonly used kitchen appliances.

Each side of the switchboard is flanked by a shadow box. One contains colored transparencies showing the wiring necessary to "make a modern leisure living home." The other contains cartoons (shown above) which humorously depict the hazards of poor wiring and benefits of good wiring.

Completing the display is an 8-ft panel which wraps up the AW story. It explains that adequate wiring consists of a large enough service entrance, sufficient branch circuits and enough convenience outlets. It also contains a wiring layout for a typical modern home plus a labeled display of various sizes and types of wire, fuse panels, circuit breakers and wiring material.

MECO says the exhibit has created terrific interest wherever it has been shown. The volume of questions that it has evoked is strong indication of its educational value. Cost of the exhibit was about $800. It was designed and built by the company's own display department.

AW Film Gets Flood of Response

Since the announcement of its new adequate wiring movie, "The Magic Link," (EW, Aug. 9, p 163) Con Edison reports 66 prints have been ordered by 34 utilities in the U. S., Canada, Alaska and Hawaii.

Comments like "Beautifully done," and "A splendid contribution" have poured in and Con Edison says it is already well into November in its bookings for audition prints. Many companies are incorporating the film into their adequate wiring programs and showing it at builders meetings, fairs, service clubs and appliance demonstrations.

The 16mm movie, in color and with sound, may be had on a temporary loan of one week at no charge, or on a permanent basis at the following prices:

1. $175 per print with no changes in the master negative;

2. $700 for first print and $200 for each additional print if ordering company inserts its own name for Con Edison's in opening and closing titles and eliminates the one reference to Con Edison in the picture's dialogue. Only credit to Con Edison would be in closing acknowledgment, "produced by George Blake Enterprises, Inc. for Con Edison Co of N. Y., Inc."

Direct inquiries to L. A. Scofield, vice president, Con Edison, 4 Irving Place, New York 3, N. Y.

San Diego to SELLabrate

More than 400 retail electrical dealers will participate in a Diamond Jubilee SELLabration Days, Oct. 18-30 to be staged by San Diego Gas & Electric Co, Bureau of Home Appliances of San Diego County and various local agencies. Special sections will be published in San Diego newspapers. Event is timed to coincide with turning on of new 100,000-kw unit at SDG&E's Encina plant.

S & S Shorts

AHLI Sets 3-Point Program

American Home Lighting Institute, Chicago, will intensify its present promotion program with a new three-point campaign to gain greater national acceptance for installed lighting fixtures. The points: 1. to encourage wider use of AHLI labels by members, 2. to stress value of built-in fixtures in modern construction to architects and decorators, 3. to publicize their benefits to present and prospective home owners.

Carousels, Kids and Sales

Free rides for the kids on a merry-go-round parked in front of his store helped build traffic for a Bridgeville, Pa., dealer during a recent three-day major appliance campaign. Tickets to ride the small jeep-driven carousel were given to parents inside the store. Some 500 people signed registration cards to provide dealer with new list of prospects.

Bonus Bags Sell Bulbs in Texas

"Balanced budget bonus bags" is a promotion aimed at filling empty lamp sockets and providing spare bulbs to assure that lamps will continue to be used. The promotion was tried this year by El Paso Electric Co following a successful campaign last year by another Texas company, Southwestern Public Service Co, Amarillo.

Public Service reports over 24,000 bonus bags containing 630 w in bulbs were sold at a cost of about $6,000 to the company. Estimated revenue over the life of the bulbs will be about $143,000. Here is how El Paso Electric handled its promotion:

Bonus bags, containing six lamp bulbs, were sold by dealers at a 20-cent saving per bag. Packages were made up by the dealers from bulbs in their stock. Each bag contained one 40-w, two 60-w, two 100-w and one 150-w bulbs. Valued at $1.18, the customer paid only 98 cents. At the time of sale, the salesman removed an attached coupon and wrote the name of the store and his name on the reverse side. For every coupon forwarded to the utility, 20 cents was returned to the dealer. In addition, salesmen were offered merchandise prizes for every 50 bags sold.

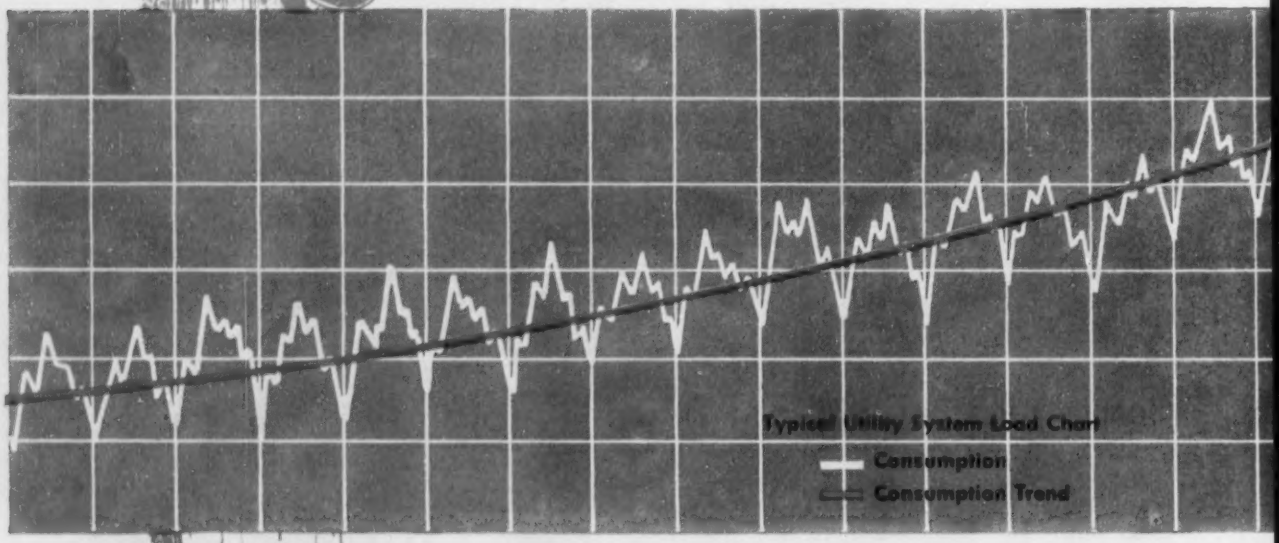
Material announcing the promotion was sent to all retail stores served by the utility that sold or wished to sell bulbs. To receive promotional supplies, the dealer returned a registration card. The utility supplied advertising pennants for store use, polyethylene plastic bags for packaging the bulbs, and coupons to attach to each bag. Newspaper ad mats, prize selectors, and order blanks also were furnished.

REDDY KILOWATT
BALANCED BUDGET BONUS BAG!
BUY THESE 6 LAMP BULBS
SAVE 20c ON EACH BAG OF BULBS!
EACH BUDGET BAG CONTAINS
1 40-WATT BULB
2 60-WATT BULBS
2 100-WATT BULBS
1 150-WATT BULB
★ $1.18 VALUE FOR 98c ★

ADVERTISING MATERIAL, plastic bags and coupons were sent to dealers by El Paso Electric Co during the lamp bulb promotion. Salesmen won merchandise prizes for every 50 bags of bulbs sold

R E L E N T L E S S

Just as regular and relentless as the tide is the ebb and flow of the utility load as determined by the demands of its customers. This is as it should be except that everywhere you turn there are more customers . . . hence more demand.



Moloney has expanded its facilities to keep pace with the industry. Today, Moloney stands ready, as it always has, to meet the needs of utilities with the most modern and adequate facilities backed by 58 years of experience devoted exclusively to the manufacturing of fine transformers.

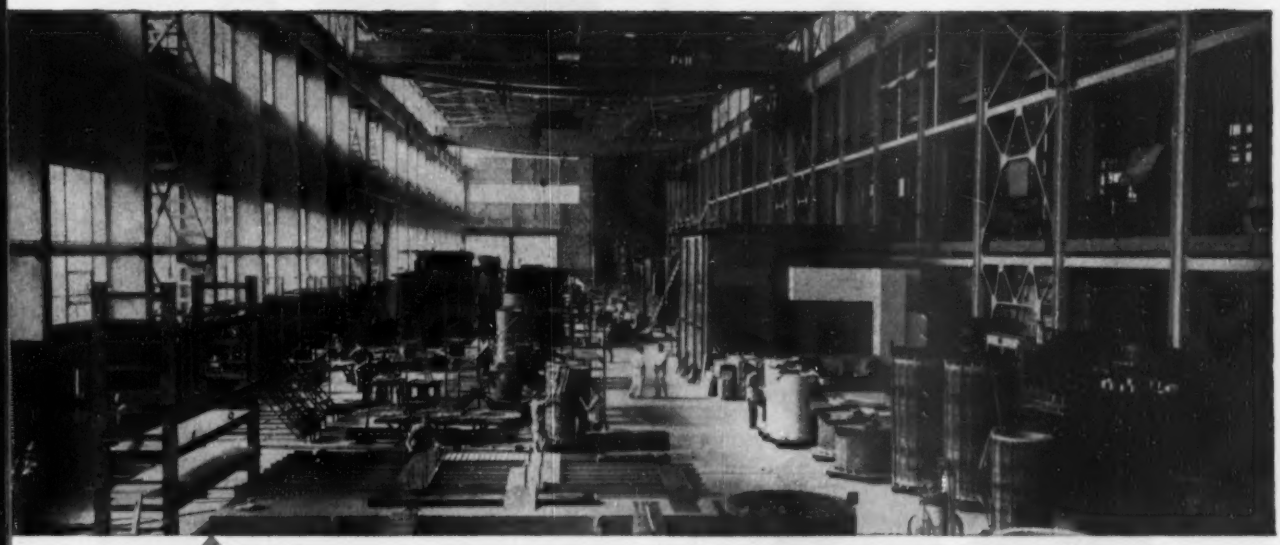
ME84-40

M O L O N E Y

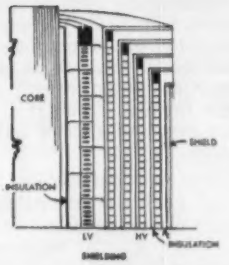
Power Transformers • Distribution Transformers
Load Center Transformers • Unit Substations • Network

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT

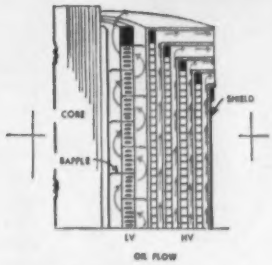
AS THE TIDE...



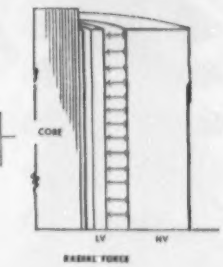
Moloney, in planning the expansion of its facilities for the manufacture of large Kva power transformers, included equipment for the fabrication of concentric layer high voltage windings. Concentric layer high voltage windings possess these inherent qualities.



Shields are placed on the outside of the high voltage coils. Insulation is placed between winding and between layers. The proximity of insulation within the winding provide superior dielectric strength.



High voltage concentric layer windings have axial ducts which permit unrestricted oil flow past each conductor. Oil flow is therefore directed through the winding itself to provide the most efficient heat transfer.



Since high voltage windings are wound about the same axis as the transformer low voltage windings, all mechanical forces are radial.

ELECTRIC COMPANY

Step Voltage Regulators • Regulating Transformers • Load Tap Changing Transformers
Transformers • Constant Current Transformers • Capacitors • Transformers For Electronics

ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA

Type "ST-SODERTITE" POTHEADS

end cable end troubles

NO GASKETS

These potheads are factory assembled, with metal-to-porcelain soldered joints. This method (exclusive with G&W) completely eliminates the possibility of future trouble due to loosely gasketed joints. When these potheads are used, the responsibility for properly sealed joints rests with our factory. Troubles due to aging, cold flow and permanent set of gasket materials are eliminated.

Since their introduction in 1940, type "ST-Sodertite" potheads have achieved an excellent service record on gas filled as well as standard cables. Many electric utility companies have standardized on them.

Send for bulletin AA50

G&W ELECTRIC SPECIALTY CO.

7780 Dante Ave., Chicago 19, Ill.

Representatives in principal cities of U.S.A.
In Canada—Powerlite Devices, Ltd., Toronto, Montreal & Vancouver

A543

Alaskan Order . . .

. . . for turbines and generators for Purple Lake project given to Pennsylvania and Ohio firms

Metlakatla Indian Community in Alaska has ordered turbines and generators for a $1.5 million hydroelectric project and expects to call bids soon for penstock and powerhouse construction, as well as for switchgear and a substation.

Elliott Co of Jeannette, Pa., will supply two 1,000-kw waterwheel generators for $40,652. James Leffel & Co of Springfield, Ohio, will furnish two 1,765-hp turbines and accessories for $103,953.

Work on a ½-mi tunnel, headworks, and a tramway for the Purple Lake project is about half completed, according to Hubbell & Waller Engineering Corp, Seattle, Wash., engineers for the project.

The project is situated on Annette Island south of Ketchikan. It will supply power to all principal installations on the island, including the community's salmon cannery and sawmill, an air base, and Coast Guard installation.

Aluminum Resistance Standard Set by IEC

A proposed basic international standard of resistance for aluminum, corresponding to the resistivity of very high purity aluminum has been agreed upon by delegates from seven countries to the International Electrotechnical Commission meeting at Philadelphia.

The basic value of resistance agreed upon is 0.027027 ohm mm sq per meter. In addition, a value for the resistivity of hard-drawn aluminum wire was tentatively approved as .028264 ohm mm sq per meter as the maximum resistivity. This will be on trial for a period of six months before being given consideration for final approval.

Other resistivity values were approved on the basis of the new standard. The maximum resistivity value for aluminum bus conductors was set at 0.0290 ohm mm sq per meter. Basic standard mechanical values for galvanized steel wire for ACSR were also set.

On the basis of the agreements reached, the Canadian Secretariat for the committee will prepare specifications which will be circulated to the national committees of the 30 countries that are members of the International Electrotechnical Commission.

Copper Data Quarterly

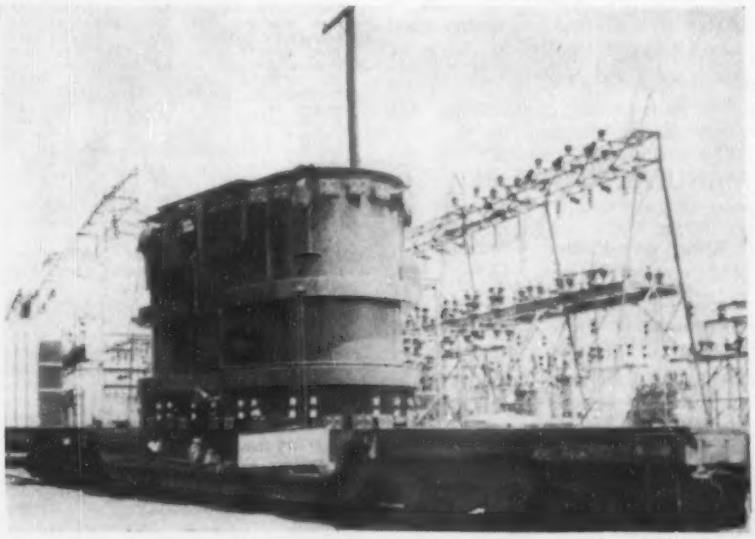
First issue of "Copper Industry Quarterly Report", consolidating for the first time all statistics on copper, has just been published by the Commerce Department's Business and Defense Services Administration. Supply, distribution, consumption, exports, and sales trends for all raw and semi-finished copper products will be covered. Annual subscriptions are 50¢ from Government Printing Office, Washington 25, D. C.; single copies at 15¢ from Commerce Department, Washington 25, D. C.

Anaconda Includes Line Of Soldersealed Potheads

Anaconda Wire & Cable Co is adding soldersealed potheads to its line of cable accessories. The potheads are available from stock parts; single conductor, outdoor type, 15 to 46 kv, all conductor sizes, for use with single- or three-conductor cables.

The company reports that increasing interest in the soldersealed type is partly due to the necessity for tighter seals because of the tendency toward freer-flowing oils in potheads and cables and more severe load-temperature cycles.

The soldersealed pothead line is being listed in Anaconda's General Catalog No. C-79 subsection 1330, also in a separate catalog No. 6-79-30. In both publications the sealing process is described, pothead construction is shown, and field installation is given briefly. Tables list dimensions and pertinent data for all sizes.



JCP&L Gets Giant SC Transformer

Jersey Central Power & Light Co has received the largest self-cooled power transformer ever built by General Electric Co. The unit weighs 392,000 lb fully assembled, was shipped from Pittsfield, Mass., and will be installed at the Raritan River Station at Sayreville, N. J.

The unit's self-cooled rating is 84,000 kva, but this can be increased to 140,000 kva by its 46 high-velocity cooling fans. It will connect the plants 18-kv generation to the 115-kv transmission system.

Stripped of radiators, fans, and other accessories, the transformer was shipped to Sayreville upright in its own one-piece tank on a drop-frame flat car especially designed for transformer shipment.

Aluminum Production

Primary aluminum production in U. S. for the year through August was 1,933,714,005 lb, according to the Aluminum Assn. This was an increase of about 18% over the same 1953 period, which was 1,637,067,742 lb. During August, 1954, production was 250,592,575 lb, slightly under the all-time record of 252,323,794 lb in July, but an increase of 29,502,568 lb over August, 1953.

Saft Markets Batteries

Saft Corporation of America has been organized to design, manufacture, and sell hermetically sealed nickel-cadmium storage batteries, known as Voltabloc. Prior to the incorporation the French-designed and produced battery was marketed by Cogenel Inc. Executive offices of Saft are at 304 East 44th St, New York; engineering and sales departments are located at Gregg St, Lodi, N. J., where stock is carried. Hazard E. Reeves is president; Homer W. Clapper is executive vice president; Robert Baron is in charge of industrial and commercial sales. Bernard Alcott is in charge of government and military sales.

MANUFACTURING BRIEFS

Robertshaw-Fulton Controls Co broke ground September 15 for a new $2 million plant of the Bridgeport Thermostat Division. Location is at Milford, Conn., and completion is scheduled for June 1955. On the 15-acre site will be erected a one-story plant having 180,000 sq ft of floor area. Offices, engineering department and laboratory will occupy 25,000 sq ft in the new structure. This new plant can accommodate almost twice the employees as the Bridgeport plant (now approximately 500 people) if operations should be expanded. The present plant is to be sold.

Dow Chemical Co has an issue of 200,000 shares of common stock priced at $33 per share being offered to its employees under a payroll deduction plan, according to a recent report. Eligible employees may subscribe for the stock up to 10% of their annual wage. Subscriptions will be received up to October 1. Directors are excluded from the plan.

R. W. Cramer Co, Centerbrook, Conn, recently started manufacture of synchronous timing motors at Plant No. 2 in Ballouville, Conn. The increased facilities include approximately 20,000 sq ft of floor area where about 125 people are employed.

Thor Corp, Chicago, has discontinued its built-in range, refrigerator, and freezer lines and will concentrate its entire sales and promotion efforts on its new laundry appliances.

Unistrut Products Co, Chicago, has announced UL approval of Unistrut channels (Sizes P-1000, P-2000, P-3000, and P-4000) and certain fittings as a surface metal raceway for wiring up to 600 v.

MEETINGS CALENDAR

(*Continued from page* 19)

***PENNSYLVANIA ELECTRIC ASSOCIATION**
Fall Meeting, Systems Operation Committee, Alexander Hotel, Hagerstown, Md., Oct. 7-8; System Planning Committee, Lehigh Valley Club, Allentown, Pa., Oct. 11-12; Fall Meeting, Relay Committee, Hotel Alexander, Hagerstown, Md., Oct. 14-15; Fall Meeting, Electrical Equipment Committee, Hotel Robert Treat, Newark, N. J., Oct. 19-20; Fall Meeting, Communications Committee, Hotel Abraham Lincoln, Reading, Pa., Oct. 25-26; Fall Meeting, Transmission and Distribution Committee, Alexander Hotel, Hagerstown, Md., Nov. 4-5.

CONTROLLERS INSTITUTE OF AMERICA
Annual Meeting, Edgewater Beach Hotel, Chicago, Oct. 10-13.

INTERSTATE POWER CLUB
Meetings will be held at Hotel Martinique, New York, on following dates: Oct. 11, Dec. 6.

IOWA UTILITIES ASSOCIATION
Annual Management Conference, Hotel Fort Des Moines, Des Moines, Iowa, Oct. 11-12.

NATIONAL INDUSTRIAL CONFERENCE BOARD
Third Annual Conference on Atomic Energy in Industry, Hotel Commodore, New York, Oct. 13-15.

***NATIONAL ASSOCIATION OF SUGGESTION SYSTEMS**
12th Annual Convention, Drake Hotel, Chicago, Oct. 18-19.

NATIONAL SAFETY CONGRESS-EXPOSITION
Conrad Hilton Hotel, Chicago, Oct. 18-22.

OKLAHOMA UTILITIES ASSOCIATION
Electric Light and Power Division, Western District Meeting, Duncan, Okla., Oct. 21; Eastern District Meeting, Ada, Okla., Oct. 22; Annual Convention, Mayo Hotel, Tulsa, Okla., March 24-25, 1955.

SOUTHEASTERN ELECTRIC EXCHANGE
Accounting Section, Roanoke Hotel, Roanoke, Va., Oct. 21-22; General Sales Conference, Roosevelt Hotel, New Orleans, La., Oct. 28-30; Accident Prevention Committee, Heidelberg Hotel, Baton Rouge, La., Nov. 11-12; Annual Meeting, Boca-Raton Hotel and Club, Boca Raton, Fla., March 21-23, 1955; Engineering and Operation Section, Roosevelt Hotel, New Orleans, La., April 7-8, 1955.

PUBLIC INFORMATION PROGRAM
Annual Workshop Conference, Chase and Park Plaza Hotels, St. Louis, Oct. 27-29; Mid-Atlantic Region, Hotel Statler, Washington, D. C., Nov. 12.

AMERICAN WELDING SOCIETY
National Fall Meeting, Sherman Hotel, Chicago, Nov. 1-5.

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
Annual Meeting, Haddon Hall Hotel, Atlantic City, Nov. 8-11; Winter Meeting, Chicago, March 13-18, 1955.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS
Annual Convention, La Salle Hotel, Chicago, Nov. 8-12.

AMERICAN STANDARDS ASSOCIATION
36th Annual Meeting and 5th National Conference on Standards, Hotel Roosevelt, New York, Nov. 15-17.

WISCONSIN UTILITIES ASSOCIATION
Electric-Gas Sales and Engineering Convention, Schroeder Hotel, Milwaukee, Nov. 17-19.

NATIONAL FARM ELECTRIFICATION CONFERENCE
1954 Meeting, Van Curler Hotel, Schenectady, N. Y., Nov. 18-19.

***PACIFIC COAST ELECTRICAL ASSOCIATION**
Joint Fall Conference of PCEA's Administrative Service Section and Accounting Section of Pacific Coast Gas Association, Sir Francis Drake Hotel, San Francisco, Nov. 18-19; Joint Spring Conference of PCEA's Administrative Service Section and PCGA's Accounting Section Jokake Inn, Phoenix, Ariz., April 7-8, 1955; Annual Convention, Palace Hotel, San Francisco, May 11-13, 1955.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS
Annual Meeting, Statler Hotel, New York, Nov. 28-Dec. 3.

***PUBLIC UTILITIES ADVERTISING ASSOCIATION**
Annual Meeting, Region 2, St. Moritz-on-the-Park, New York, Dec. 2-3.

21ST NATIONAL POWER SHOW
Sponsored by American Society of Mechanical Engineers, Commercial Museum, Philadelphia, Dec. 2-7.

EASTERN JOINT COMPUTER CONFERENCE-EXPOSITION
Sponsored jointly by American Institute of Electrical Engineers, Institute of Radio Engineers, and Association for Computing Machinery, Bellevue-Stratford Hotel, Philadelphia, Dec. 8-10.

ELECTRICAL EQUIPMENT REPRESENTATIVES ASSOCIATION
Annual Meeting, Breakers, Palm Beach, Fla., Jan. 10-12, 1955.

NATIONAL ASSOCIATION OF PURCHASING AGENTS
24th Annual Mid-Winter Conference, Public Utility Buyers' Group, Shamrock Hotel, Houston, Tex., Feb. 13-15, 1955.

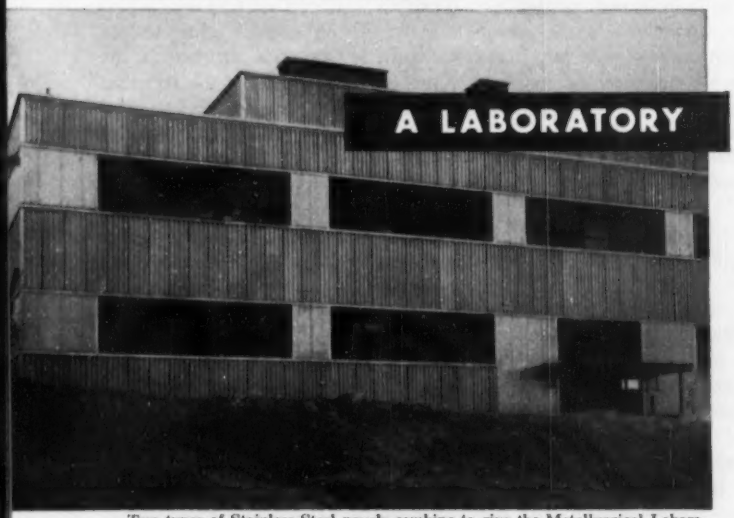
SOUTHERN SAFETY CONFERENCE-EXPOSITION
Jung Hotel, New Orleans, La., Feb. 27-March 1, 1955.

AMERICAN POWER CONFERENCE
17th Annual Meeting, Sherman Hotel, Chicago, March 30-31, April 1, 1955.

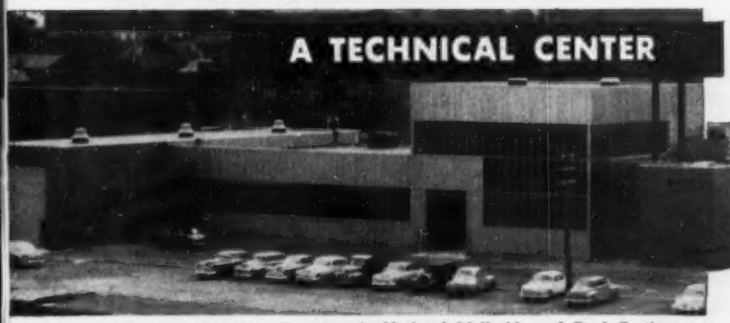
ILLUMINATING ENGINEERING SOCIETY
Pacific Northwest Region Conference, Harrison Hot Springs, British Columbia, April 25-26, 1955.

* Additions this week.

Located at Olmsted Air Force Base, Middletown, Pa., this steam generating plant is sided with more than 7,000 square feet of Stainless Steel panels. Architect-Engineer: Gannett, Fleming, Corddry & Carpenter, Harrisburg, Pa. General contractor: R. S. Noonan, Inc., York, Pa.



Two types of Stainless Steel panels combine to give the Metallurgical Laboratory at United States Steel's Fairless Works an attractive exterior. Architect: Hoffman and Crumpton, Pittsburgh, Pa. General contractor: Joseph R. Farrell, Inc., Philadelphia, Pa.



9,000 square feet of wall surface in National Malleable and Steel Castings Company's Technical Center, Cleveland, Ohio, is Stainless Steel. Architects and Engineers: Dalton-Dalton Associates, Cleveland. General contractor: The Leonard H. Krill Company, Inc., Cleveland.

These three buildings went up faster, will stay attractive longer with Stainless Steel panel construction

• Although Stainless Steel was first used as a material of construction more than 25 years ago, its use in the form of insulated panels is a comparatively recent development. But it has been accepted so rapidly that a wide variety of buildings using Stainless Steel panel construction are completed and occupied today.

Here are three structures . . . differing widely in size, in design and in purpose . . . that demonstrate the advantages of Stainless Steel panel construction.

From the standpoint of design, Stainless Steel panel construction offers simple, clean lines with a material that never loses its attractive appearance. Stainless Steel panels can be combined with other materials with pleasing results. And their method of erection—they are hung on the structural framework—allows fullest possible utilization of interior floor space.

Erection is quick and cost-saving. It requires a minimum crew and goes forward in any type of weather.

Once the building is occupied, Stainless Steel panel construction continues to pay off. Maintenance is at a minimum . . . no painting is required. The low thermal conductivity of these insulated panels holds down heating and cooling costs. And the life of the building is long.

If you would like more information on panel construction with USS Stainless Steel, mail the coupon below.

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TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

Stainless Steel panels on these buildings fabricated and erected by H. H. Robertson Co., Pittsburgh, Pa.

United States Steel Corporation
Room 4519, 525 William Penn Place
Pittsburgh 30, Pa.

☐ Please send me literature on Stainless Steel panel construction.

☐ Please arrange to have fabricators of Stainless Steel wall panels send me literature on their particular type of construction.

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4-200B

UNITED STATES STEEL

Southern California Edison Gets $9,835,000 a

Southern California Edison Co has received $9,835,000 a year rate increase from the California Public Utilities Commission in a lengthy opinion which settled a rate case begun in December, 1952. This is compared to $18,627,000 (based on 1954 results) originally petitioned for by the company.

In justifying the need for higher rates, the company stated that "the present rates are insufficient to provide a fair, just and reasonable return on properties devoted to the public service, and must be augmented in order to maintain its financial integrity, to preserve its credit standing and to attract, on an economical basis, funds necessary to build the plant additions required to continue satisfactory electrical service to present customers and to meet requirements of new customers."

The company further claimed that the devaluation of the dollar has raised the total unit cost of plant from ". . . $542 per meter as of Jan. 1, 1946 and $656 added meter during the years 1946 through 1951 inclusive and approximately $1,000 per added meter estimated for the years 1952 and 1953."

Costs Increasing

The opinion continued "Applicant also claims that operating costs are increasing and refers to the asserted fact that in 1945 charges for operation, maintenance, depreciation, and amortization were 39.6% of gross operating revenue and by 1951 had risen to 51.4% of gross operating revenue. In addition, during the same period tax rates increased. Applicant contends that it will continue to be affected in the future by the effects of rising prices, spiraling wages, and certain other economic developments over which it has no control."

The opinion also noted the company's claim that some of the problems which it faces have arisen from the extremely rapid growth of the company's territory, the exhaustion of economical hydroelectric sites and the need to install comparatively expensive steam plants.

On the subject of inflation, while the commission admitted that substantial inflation had taken place, nevertheless "the record shows that applicant has been able to finance itself under reasonable terms during the inflationary period, the market has absorbed the additional and substantial flotations of applicant's stock since 1945, and the current relatively high price of such stock on the market bespeaks confidence of the investing public in the applicant's operations under the methods of regulation used by this commission in the past."

Inflation

The commission dismissed the company's inflation testimony by saying: "Applicant's inflation testimony is designed to support its request for extensive increases in rates, which would result in considerably higher earnings and dividends on the common stock, compared to the commission's traditional allowance for an electric utility of equivalent stature. Such action would protect only one class of security holder, the common stockholder, against the risk of loss of purchasing power and not benefit the bondholder or preferred stockholder. It would penalize the ratepayer without a concomitant consideration."

With regard to the rate of return, the company claimed that it should be allowed to earn 6.29% on a net original book rate base of $544,883,000. A footnote in the opinion stated: "Such earnings would be equivalent to a return of 5.05% on applicant's estimated fair value rate base of $690 million and to a return of 4.26% on applicant's so-called real historical cost rate base of $819,606,000."

In its discussion of equity earnings of other companies having characteristics comparable to those of the company, the commission said significantly: "While it is true that such (earnings price) ratios may indicate the terms under which a new investor might devote his money to the business, it does not mean that they should measure the return the applicant is entitled to receive on its investment in its properties. Certainly, the dividend rate the management has elected to establish for its common shares should not be used in arriving at the return the consumer should pay on the rate base."

After giving consideration to the company's past rate of growth, its future commitments and the fact that the applicant will be required to raise additional money from the public in the future, the commission said: "Upon a careful consideration of the evidence before us we are of the opinion that applicant's revenues, based on the estimated year 1954, should be increased to provide a return of 5.90% on a depreciated historical cost rate base."

It should be noted, however, that because of a certain municipal lease agreement which "freezes" rates to that municipality, the effective rate of return is only 5.6%.

With respect to operating revenues and expenses the commission found applicant's revenues too conservative and, using its own projection for 1954, increased them $3,325,000, or 2.3% over those of the company.

With regard to operating expense, the commission made only one major disallowance in the amount of $742,000 because of differences in estimating line losses.

Net Original Cost

As to the determination of the rate base, the commission found that net original cost rate base is the only proper one for the current proceedings and, consequently, excluded the unamortized balance of account 100.5 in the amount of $491,000 as an element of rate base. However, the commission did allow the annual amortization of account 100.5 in the amount of $262,000 as a proper operating expense. The PUC stated: ". . . it appears to us to be fair and reason-

Year Rate Hike

able, in order to make the purchaser whole, to allow the amortization of the excess purchase price as an operating expense for rate-making purposes."

As to working capital, the principal downward adjustment made by the commission was in working cash. Instead of the $6.5 million claimed by the company for 1954, the commission allowed $2,570,000. This compared with only $1,150,000 proposed by the staff.

Working Cash

The commission stated: "After considering the subject of working cash, it is our opinion that the lag in payment of bond interest tends to offset the lag in collection of the return portion of revenue, and that for rate-making purposes the staff's method gives a reasonable measure of the capital advanced by investors for working cash purposes. Furthermore, the stockholder is not paid dividends prior to the time the money is collected. The delay in collection of the return portion of revenue is only some 49 days rather than 75 days as stated by applicant. In view of the fact that we have adjusted certain expenses herein, further adjustment in the allowance for working cash is necessary. An allowance of $1,570,000 for working cash has been computed for 1954 but after allowing for the effects of earlier tax payments in 1955 as provided in the recently revised federal tax bill an allowance of $2,570,000 will be adopted."

It is also of interest to note that the company presented a cost of service study based on a taxable income basis which indicated that the domestic group of customers produced a rate of 5.9%; lighting and small power, 9.5%; while large power on transmission, 2.9%. A rate of return of 4.97% was earned in 1952 by the system as a whole. In addition the PSC made an upward adjustment of the company's depreciation reserve.

Puget Sound P&L Gets New Heating Rate

The Washington State Public Service Commission has approved a new rate schedule of the Puget Sound Power & Light Co for the use of electricity in space heating.

The company had accepted no applications since World War II, when the government declared there was a power shortage, but believes it now has the capacity to take care of the extra load that would come with space-heating. In cases where the connected load is kept below 10 kw, the person heating his home with electricity will continue on the all-electric rate, which allows him the first 270 kwhr for $4.50, plus 7¢ per kwhr up to 1,000 kwhr and 1¢ per kwhr over 1,000 kwhr.

If a person's connected load is over 10 kw, he pays 1.8¢ per kwhr for everything over 10 kw, at 160 kwhr per kw, under the new rate.

The company specifies that it must approve installations under the new rate and that thermostatic control be provided.

PP&L Will Request Superior Court Review

Pennsylvania Power & Light Co will request the Supreme Court of Pennsylvania to review the recent decision of the Superior Court, Pres Charles E. Oakes said.

The Superior Court had disallowed as an operating expense for rate purposes an amortization item of $1,746,150 per year for 15 years or a total of over $26 million. The foregoing amortization of electric plant acquisition adjustments was a charge against all customers and corrects an item that Electrical World ran (Sept. 13, p 5).

Under a prior order of the Pennsylvania Public Utilities Commission, annual amortization in this amount commenced in 1945 and is scheduled to end in 1959.

Oakes stated that in his judgment the effect on the company's net operating revenues, in case the Superior Court decision prevailed, would be a reduction in net operating revenue of approximately $1.1 million based on the test period for the 12 months ended Oct. 31, 1951, on which the PSC order was based.

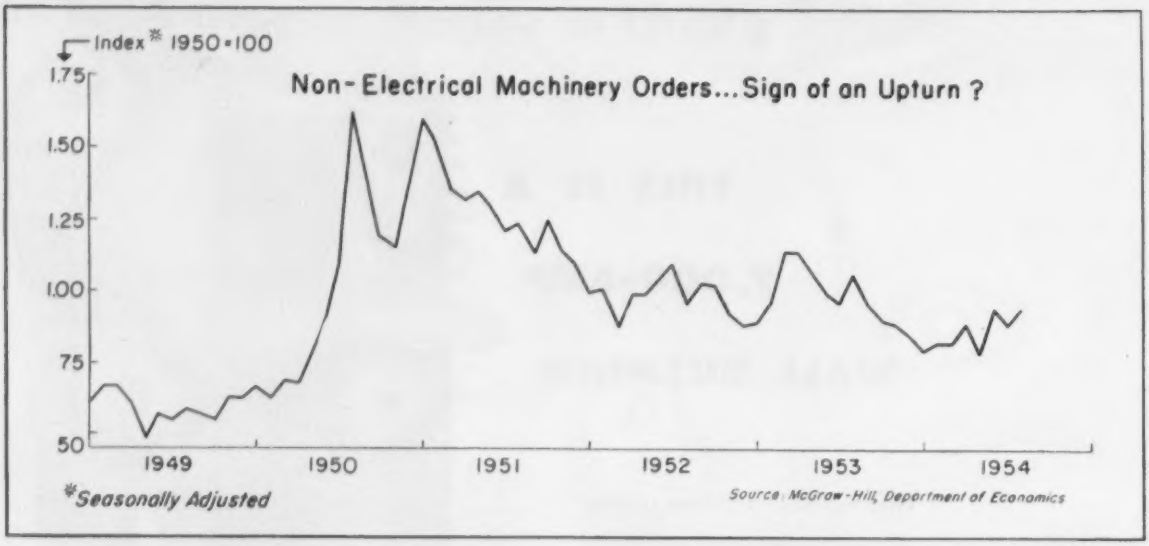
Rate Briefs

Central Illinois Light Co is planning to increase rates . . . Kansas City Power & Light Co's rate structure is "not adequate to support the present plant investment," Pres H. B. Munsell informed the Missouri Public Service Commission in asking for a rate increase. He said the company will spend $97 million for construction in the next four years. The increase in Kansas and Missouri will amount to $4,138,100 and would yield a return of about 6½% on net original cost over a three-year period, he said.

Gatineau Power Co has asked the Quebec Electricity Board for a 10% rate increase in Hull and 15% in other communities in Western Quebec.

Tennessee Valley Authority has estimated that its customers have saved $70 million in fiscal year 1954. Estimate is based on comparison of TVA electricity prices and average rate schedules across the nation.

ELECTRICAL BUSINESS OUTLOOK



Nonelectrical Machinery Orders Turn Up

New orders for nonelectrical machinery have turned up. It's not much of an upturn, yet—as the chart above shows. But, so far, it's one of the most encouraging signs available in the outlook for business.

A rise in machinery orders, if it continues, will eventually mean a rise in machinery production. That, in turn, would eventually be translated into faster growth for industrial power consumption as new machines go on the line and start turning out goods.

So far, however, the rise in machinery orders is a very long way from leading to these desirable results. The rise may have to continue for another year or so before it actually leads to an increase in machinery production. And it may be reversed in the next month or so. But it's a welcome sign, nevertheless.

Order Backlogs Since 1951 . . . Producers of nonelectrical machinery have been living dangerously for several years—working in the shadow of the day when their backlogs would run out and they would have to depend on current orders. They have been living off backlogs ever since 1951.

The chart above shows how machinery orders have come in since 1949. Orders hit a fantastic peak of 163 on the McGraw-Hill index (1950 equals 100) in August, 1950. That peak was almost two and one-half times the level of orders in the first four months of the year—pre-Korea.

Orders stayed very high through the first half of 1951. But they have been dropping ever since, with only slight and occasional interruptions. In January, 1954, new orders for nonelectrical machinery hit a bottom of 80 on the index (which is seasonally adjusted)—just half of the peak point in August, 1950.

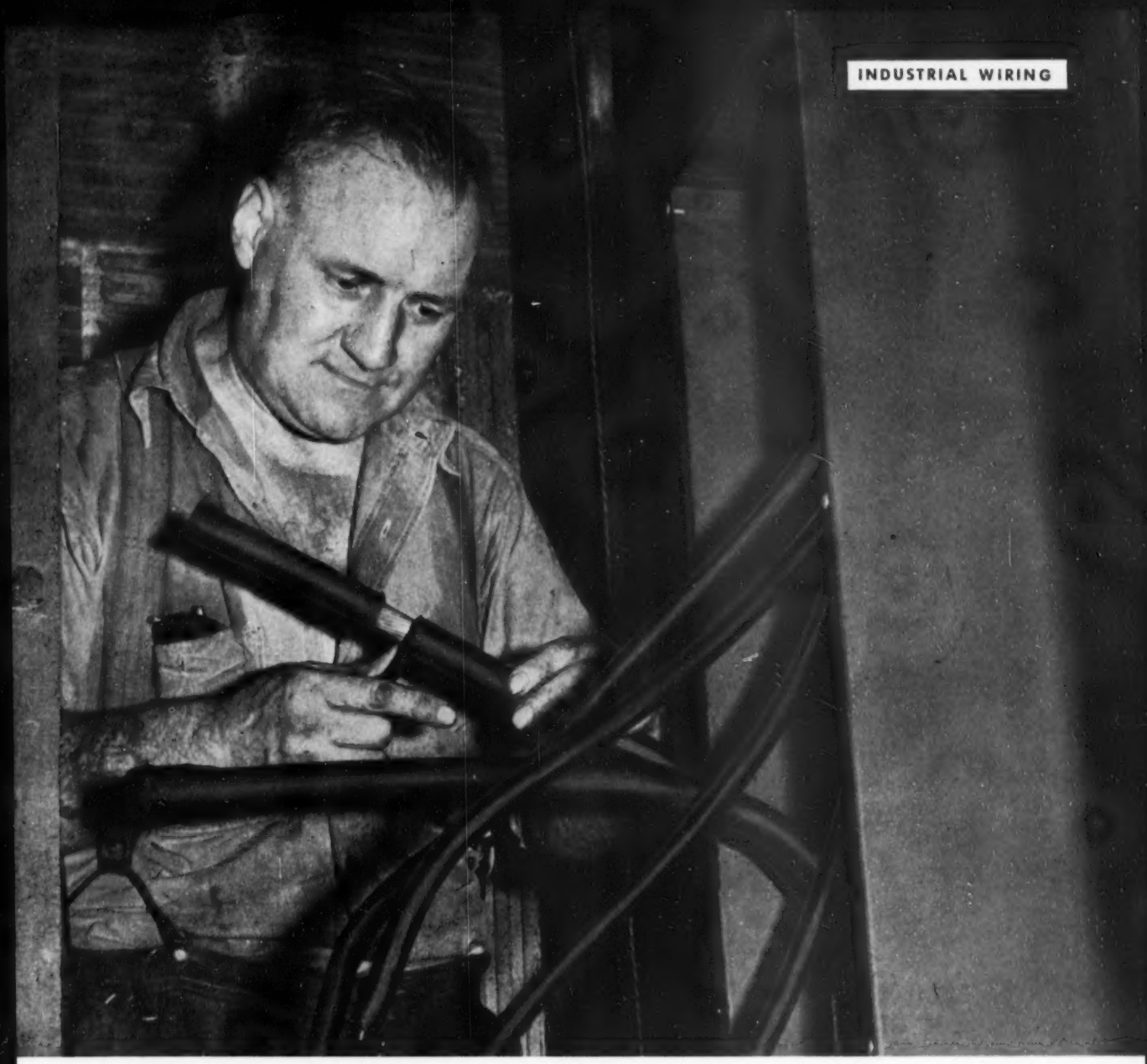
Meanwhile, machinery production rose steadily between 1950 and early 1953, as producers worked on this backlog of early post-Korea orders. But for years, producers have been watching the backlogs shrink as production rose and new orders fell.

Finally, in early 1953, the backlog got too small to keep production up. Output of nonelectrical machinery has dropped 15% from its peak to mid-1954. And the prospect, until recently, was that it would have to drop a good deal farther before leveling off—because new orders for nonelectrical machinery in the first eight months of 1954 were 16% below even their inadequate level in the corresponding months of 1953.

It's impossible to tell just how much farther new orders must rise before they balance with current production. They are back to 96 on the index now. But an "educated guess" puts the difference between orders and production somewhere in the range of 5-10%—that is, if new orders don't rise by that much, production will have to decline before a balance is struck.

Business Capital Expenditures Still Dropping . . . The Commerce Department's latest figures on business spending for new plant and equipment gives a clue to the direction of machinery production in the near future. According to Commerce, business capital expenditures are still dropping, as they have been since the third quarter of 1953.

Business plans to invest at a rate of about $26 billion a year in the fourth quarter of 1954, says the Commerce Department. That's down from $26.75 billion in the third quarter, and well below the $28.9 billion rate in July-September, 1953. Commerce figures imply that machinery production will come down some more before it levels off.



FEWER SPLICES need be made when you run "all purpose" Durasheath. It can be run buried, overhead, in ducts . . . in one continuous run.

New trend in industrial wiring: Neoprene jacketed cable

Users find this tough, long-lasting "premium" cable actually costs little more to use . . . then cuts upkeep.

A chemical plant in Texas uses ANACONDA Durasheath* neoprene jacketed cable *as building wire* for power and lighting. A plant in St. Louis does, too. Another in Chicago.

The practice of using versatile Durasheath for power cable has caught on from coast to coast. And there's good reason.

This cable costs little more to use than the cheapest cable you can buy—and more than makes up this difference in long trouble-free service, lower maintenance costs!

Durasheath's tough jacket is made of specially compounded neoprene. It shrugs off heat, moisture, corrosive fumes. And it takes rough handling in stride. As demand for power rises, Durasheath provides added reliability.

Industry engineers call Durasheath "good insurance." And it is!

Durasheath comes in all sizes, single and multiple conductor, copper and aluminum from 600 to 15,000 volts. You can run it in the ground, overhead, in damp ducts in *one continuous run* with minimum splicing. Want more information? See your Anaconda Representative or write *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

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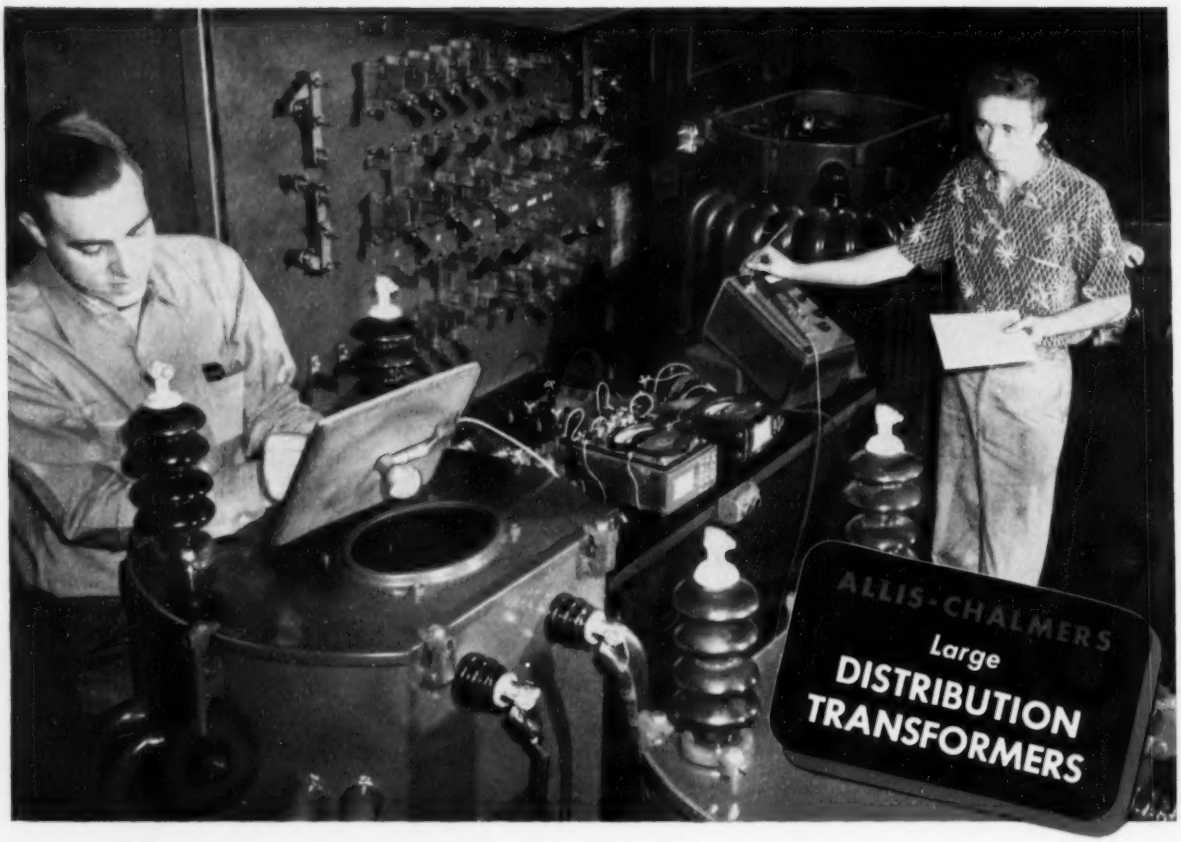


Sound Levels Checked

by PRODUCTION LINE sound level testing

As distribution systems grow, distribution transformers in residential areas are getting larger. It's more important than ever to keep noise levels low.

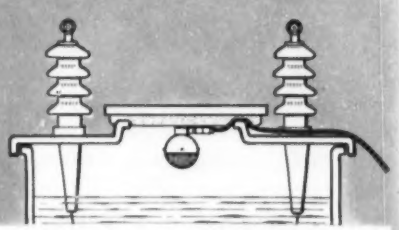
Since 1951, Allis-Chalmers has been conducting *production line* noise level checks on large distribution transformers. As a result, Allis-Chalmers has consistently delivered uniformly quiet transformers.

Sound level research, too — In cooperation with sound experts, Allis-Chalmers engineers are conducting research in magnetostriction in electrical core steels and resonance in core structures of all sizes and ratings. They are testing the effects of clamping pressures and anchoring of core and coil assemblies. Allis-Chalmers operates a separate, specially designed sound laboratory with extensive equipment for sound level research.

The result is a complete line of transformers that helps utilities build good will. If you would like more information on this or any other Allis-Chalmers transformer development, contact the A-C office nearest you or write Allis-Chalmers, Milwaukee 1, Wis.

A-4366

How It's Done



Here's how noise checks are made under normally noisy manufacturing conditions: The air space in the transformer tank above the oil becomes a miniature sound room. A microphone is suspended into this space and it is sealed from external noises. The microphone picks up noise when the transformer is energized. Noise level value is recorded and checked against established values.

ALLIS-CHALMERS